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# Materials Usage in the United States Great Lakes Basin

Great Lakes Basin Commission

John Doneth

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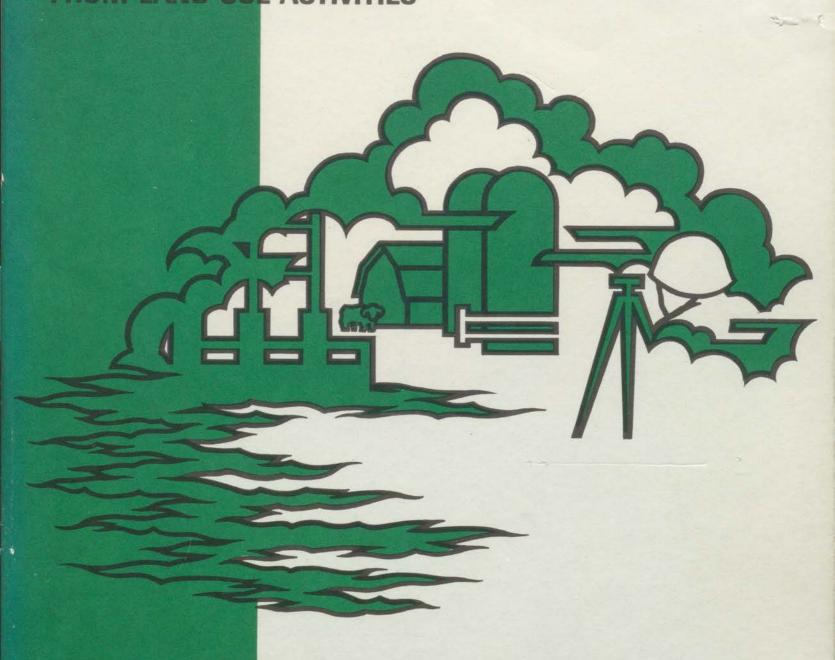
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INTERNATIONAL REFERENCE GROUP ON GREAT LAKES POLLUTION FROM LAND USE ACTIVITIES

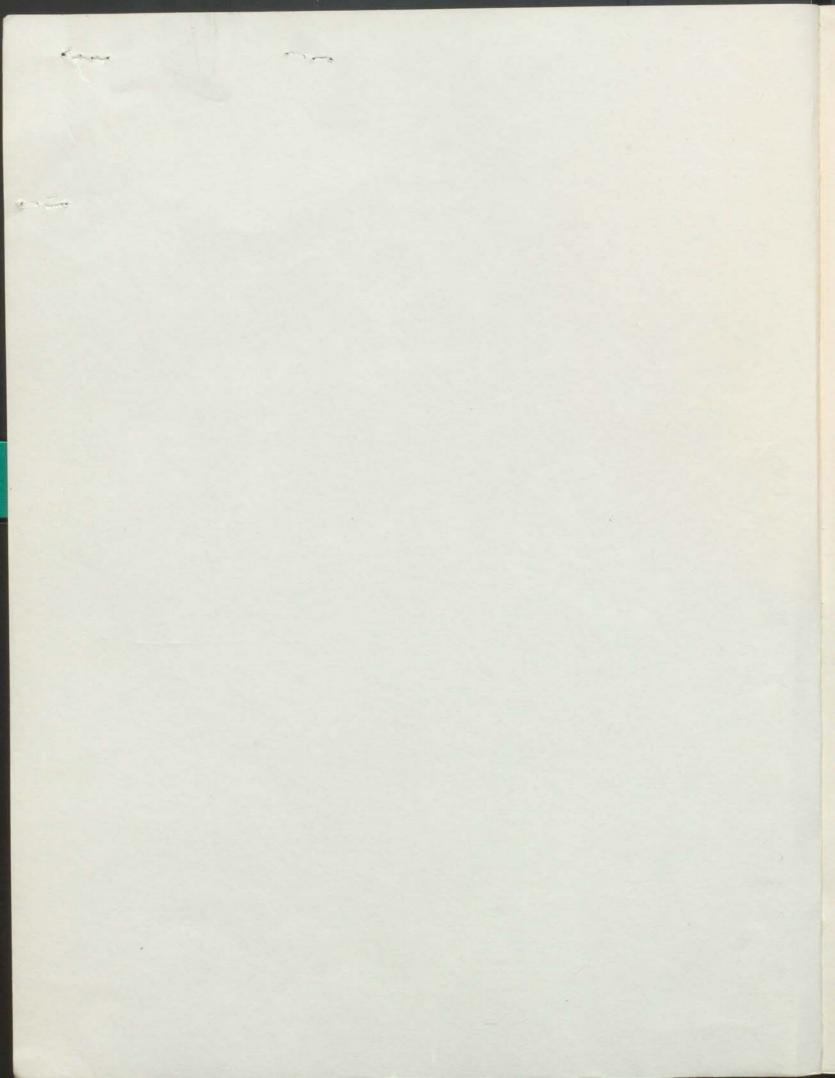
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INTERNATIONAL JOINT COMMISSION MATERIALS USAGE IN THE UNITED STATES GREAT LAKES BASIN

PREPARED BY UNITED STATES TASK GROUP B

SEPTEMBER 1975



MATERIALS USAGE IN U.S. GREAT LAKES BASIN

prepared by JOHN DONETH, East Lansing, Michigan

in cooperation with GREAT LAKES BASIN COMMISSION Ann Arbor, Michigan

funded by
U.S. DEPARTMENT OF AGRICULTURE
Soil Conservation Service
East Lansing, Michigan

prepared for
the U.S. Section of Task Group B for the
POLLUTION FROM LAND USE ACTIVITIES REFERENCE GROUP
of the International Joint Commission...
also partial fulfillment of
U.S. Environmental Protection Agency
Contract No. 68-01-1598 with the
Great Lakes Basin Commission

#### FOREWORD

This study on Materials Usage in the U.S. Great Lakes
Basin has been funded by the United States Department of
Agriculture - Soil Conservation Service in an Agreement with the
Great Lakes Basin Commission. The study, the first of its kind
in the Great Lakes region, has been of great personal interest
and will provide background for further analyses of possible
impacts to the Great Lakes.

I am particularly indebted to my son, Daniel Doneth, who spent innumerable hours in checking and cross-checking the many figures found in this report. I also wish to thank Suzanne Braley and Eugene Jarecki of the Great Lakes Basin Commission staff who spent many hours in planning and developing this report. Also, the various typists in the Soil Conservation Service East Lansing office who typed the tables have my thanks. Others greatly assisting were Robert Fellows, United States Department of Agriculture - Soil Conservation Service, James Dooley and Delbert Johnson of Michigan Department of Natural Resources, Robert Reed and Louis Meyer of the Great Lakes Basin Commission staff. To the many that I interviewed and who provided data and counseling on Materials Usage, I give my sincere appreciation.

Any conclusions, opinions and results found in the report are solely my responsibility.

John Doneth East Lansing, Michigan

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# Section 1 INTRODUCTION

#### 1.1 Purpose and Scope

The Great Lakes Pollution from Land Use Activities Reference Group was organized under the aegis of the International Joint Commission to conduct a portion of the studies developing from the Canada-United States Agreement on Water Quality in the Great Lakes. Further background is shown in "Great Lakes Water Quality Agreement, with Annexes and Texts and Terms of Reference, Between the United States and Canada," signed at Ottawa, Canada, April 15, 1972, and "Study Plan to Assess Great Lakes Pollution from Land Use Activities," dated March 30, 1973, prepared and as further updated by the Pollution from Land Use Activities Reference Group of the International Joint Commission.

The geographical area of the study is defined as the "boundary waters of the Great Lakes System." The "boundary waters" means the Great Lakes themselves and the connecting channels as defined in the "Boundary Waters Treaty," January 11, 1909. In the United States portion, Lake Michigan is considered part of the boundary waters for the purposes of this study.

The purpose of this report on Materials Usage was to provide an up-to-date inventory of production and/or usage within the United States portion of the Great Lakes Basin of certain materials applied to land with the potential of reaching the Great Lakes System through land drainage. The data on selected materials was to be collected by county, planning subarea, lake drainage area and then combined to represent the total Great Lakes Basin. See Figure 1-1 for area of study.

#### 1.2 Objectives

The study calculated the amounts of chemicals -- herbicides, insecticides, and fungicides -- used on crops. The types and acreage of various crops, pastures, vegetables and fruits were inventoried. The common rates of application were then applied to the acreage of each treated providing the calculations shown in this report.

The livestock manure produced was calculated. The amounts were based on an inventory of swine, cattle, sheep, horses, chickens and turkeys. The production in terms of nitrogen, phosphorous and potash were also calculated.

The commercial fertilizer used on farms was based on actual reports of use by state. Use by county was available for the corn belt states and was calculated for the other states. The amounts of nitrogen, phosphorus and potash in the fertilizer were likewise based on actual reports or calculated.

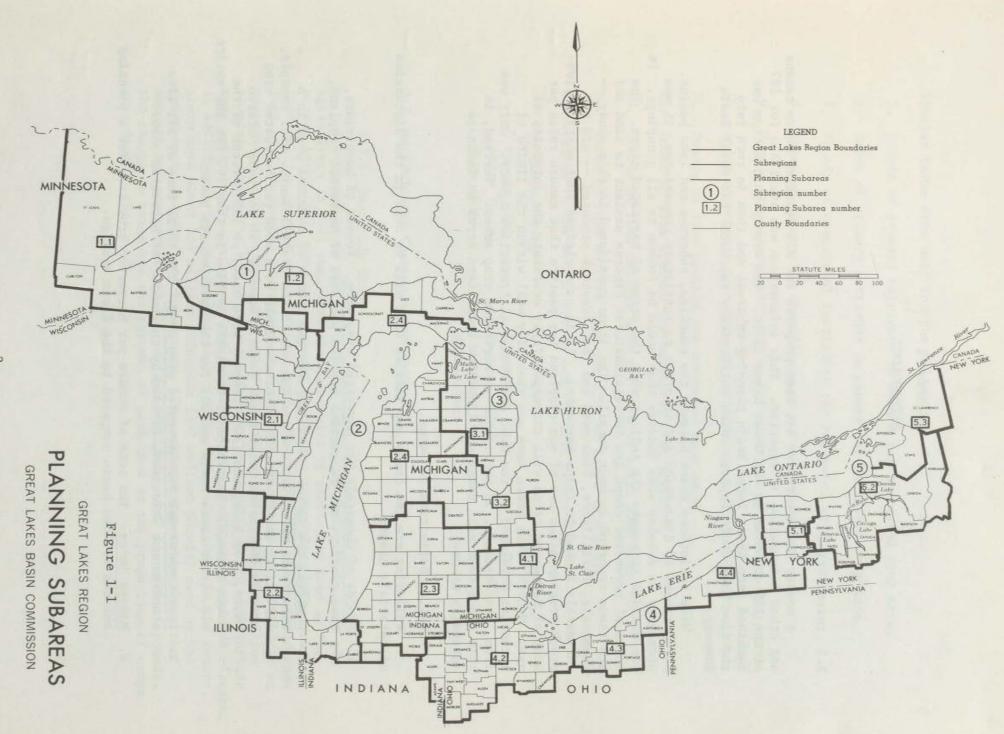
The amounts of lime applied were calculated based on actual use reports.

The salts (deicing compounds) applied to federal, state, county and municipal highways were calculated based on actual use reports.

# 1.3 Preparation and Review of the Report

The author, John Doneth, compiled the inventory of materials usage, developed the methodology and formulated the analysis. Office personnel from the Great Lakes Basin Commission at Ann Arbor, Michigan assisted in developing the format for the report, calculations, writing, typing of drafts and review. At various stages of report preparation, U.S. Task Group B representatives for the Pollution from Land Use Activities Reference Group, received and commented upon the study findings.

The accuracy of the inventory, the methodology, and the findings of the materials usage in the U.S. Great Lakes Basin are solely the responsibility of the author. The findings have not been reviewed by the International Joint Commission and do not necessarily have the concurrence of the Pollution from Land Use Activities Reference Group.



# Section 2 METHODOLOGY

#### 2.1 Introduction

A county summary report has been prepared for all counties where census and other information is reported. This information was available for 187 of the 191 counties in the Great Lakes Basin. The county information was combined into Great Lakes Basin planning subareas and then in turn into the five Lake Basin reports which collectively represent the total Basin Summary.

Wide variations exist between the counties, subareas and lake basins. For purposes of discussion and in order to facilitate comparisons, it was necessary to develop some indices that would be common to all groupings. It was decided to equate the indices with the acres of harvested crops. The acres of harvested crops are the agricultural figures easiest to find and are those reported in most detail. The items considered in this study — chemicals, fertilizers, lime used and the livestock produced — are all intimately linked to crops harvested. It is acknowledged that where a livestock program makes use of non-cropland for pasture that manure rates per acre of harvested crops will correspondingly overstate the intensity of use. Manure rates shown here are generally well within the limits of intensity developed by the U.S. Environmental Protection Agency. Only one item, road deicers, is not linked to harvested crop areas. Instead, in this study road salt usage was linked to total land acres to indicate intensity of use.

#### 2.1.1 Definition of Terms

Following are the terms and indices that will be used in the discussion of materials usage:

- 1. Pounds of chemicals per harvested crop acre. Pounds of herbicides, insecticides, and fungicides applied per acre of harvested cropland.
- 2. Chemical use index. This compares the pounds of chemical used in a subarea or area with the average use in the overall Basin. For example, 1.21 kilograms (2.66 pounds) of chemicals were used per harvested crop acre in the entire Great Lakes Basin. However, in the Lake Ontario basin, 1.38 kilograms (3.05 pounds) were used, or 115 percent of the Basin average. The index of chemicals applied is thus 100 for the entire U.S. Great Lakes Basin and 115 for the Lake Ontario basin.
- 3. Livestock manure per harvested crop acre. The total tons of all livestock manure defecated, divided by the number of harvested acres.
- 4. Manure index. The tons of manure per harvested crop acre for a planning subarea or lake basin compared to the Basin average.

Similar terms were used for the following:

- 5. Pounds of primary nutrients in manure per harvested crop acre.
- 6. Index of primary nutrients in manure per harvested crop acre.
- 7. Pounds of commercial fertilizer per harvested crop acre.
- 8. Index of commercial fertilizer use per harvested crop acre.
- 9. Pounds of primary nutrients in fertilizer per harvested crop acre.
- 10. Index of primary nutrients in fertilizer per harvested crop acre.
- 11. Pounds of lime applied per harvested crop acre.
- 12. Index of lime applied per harvested crop acre.
- 13. Pounds of road deicers used per acre of total land area.
- 14. Index of road deicers used per acre of total land area.

Conversions to the metric system used in this report were:

To Convert From	To	Multiply By
Pounds (1b)	Kilograms (kg)	0.454
Acres (acre)	Hectares (ha)	0.405
Tons (ton)	Kilograms (kg)	907.2
	Metric Tons	0.907

#### 2.2 Agricultural Chemicals Methodology

#### 2.2.1 Pesticide Study

A national study was conducted by the United States Department of Agriculture in 1971 regarding the quantities of pesticides used in the United States (1). The study showed a total of 376 million kilograms (828 million pounds) of pesticides used. There were 224 million kilograms (494 million pounds) classified as herbicides, insecticides, fungicides or miscellaneous pesticides. The other 152 million kilograms (334 million pounds) were sulfur and petroleum. Current pesticide reports will include most sulfur and petroleum in the herbicide, insecticide and fungicide classes. In addition to the above pesticides used by farmers as shown in the report, there were about 154 million kilograms (339 million pounds) used by the government, industry and homeowners. The accompanying table shows the amounts and percentages of the various pesticides used in terms of pounds, the change in usage and the percent of each used in the production of crops according to this study.

	1966	1971			
	Total Lbs (in millions)	Total Lbs (in millions)	Percent of Total	Percent Change From 1966	Percent of Total Used on Crops
Herbicides	116	228	27	+98	99
Insecticides	149	170	21	+14	91
Fungicides (excluding sulfur)	33	41	5	+27	95
Miscellaneous pesticides	56	55	7	-2	85
Sulfur	57	112	13	+96	100
Petroleum	92	222	27	+141	92
TOTAL	503	828	100	+65	92
To Convert	From	To		Multiply By	<u>y</u>

Herbicides are those pesticides used to destroy or inhibit plant growth, insecticides are those used to control insects, while fungicides are those pesticides used to control various fungi. The U.S.D.A. Study shows that herbicides represented 27 percent, insecticides 21 percent, and fungicides (excluding sulfur) 5 percent for a combined total of 53 percent of the total pesticides used by farmers in 1971.

Kilograms (kg)

0.454

#### 2.2.2 Chemical Usage in the Great Lakes Basin

Pounds (1b)

Chemical usage in the 191 Great Lakes Basin counties shows substantial variances from the U.S.D.A. Study. Herbicides are widely used in the Basin in the production of two major crops, corn and soybeans, as well as in production of grains and special crops like field beans and sugar beets. Fungicides are used widely in the production of fruit, vegetable crops and potatoes, all of which are very important in certain Great Lakes Basin counties. Thus, the total Great Lakes Basin will show herbicides and fungicides in relatively greater use and insecticides in relatively lesser use than the U.S.D.A. Study.

The classification of chemicals used in the U.S. Great Lakes Basin study will be somewhat different from the U.S.D.A. Study. It is calculated, and this has been carefully checked with University pesticide authorities, that the combined herbicide, insecticide and fungicide usage as reported in this study for the Great Lakes Basin represents approximately two-thirds of all the chemicals used by farmers in the 191 counties. Some of the sulfur, petroleum and miscellaneous pesticides shown separately in the U.S.D.A. Study are included in the herbicide, insecticide and fungicide groups in this study.

Bacteriacides is a new group of chemicals, not mentioned in the Department of Agriculture study, but now coming into greater importance. These are largely included in the fungicides in this Basin study.

Most discussions and writings in regard to chemical usage by farmers emphasizes herbicides and insecticides. More is generally known about these. Fungicides and now the bacteriacides will be receiving increased attention. In the last decade herbicide usage has increased more rapidly than the other groups of pesticides. Herbicides have largely replaced more expensive mechanical and manual means for controlling weeds and are now used in the production of almost every major crop. Corn accounts for nearly one-half of all herbicide usage. Insecticides and fungicides assume relatively greater significance in the production of the fruit and vegetable crops.

Most published information showing quantities of pesticides used tend to be broad in scope. That is, the quantities shown are totals for a class of chemicals for a specific area or a certain crop. No county figures were available in the 1969 Census of Agriculture or elsewhere and rates per acre, if shown at all, are difficult to interpret or apply.

The situation is changing as increased attention is being focused on the use of chemicals, including their role in agriculture. One indication of this is the establishment of the National Pesticide Research Center, located at Michigan State University, with a staff of specialists. These specialists and those from other Michigan State University departments, as well as some from the Michigan Department of Agriculture, have provided substantial assistance in this study. The following were especially helpful:

Dr. Howard S. Potter - - - Botany & Plant Pathology

Dr. Alan L. Jones - - - Botany & Plant Pathology

Dr. Alan R. Putnam - - - Horticulture

Prof. Leyton V. Nelson - - - Crop & Soil Science

Dr. Wm. F. Meggitt - - - Crop & Soil Science

Dr. Donald C. Cress - - - Entomology

Dr. Donald C. Ramsdell - - - Botany & Plant Pathology

Dr. Robert F. Ruffel - - - Entomology

Mr. Frank E. Klackle - - - Cooperative Extension Service

Mr. Charles A. Hines - - - Michigan Department of Agriculture State Statistician in Charge

Specialists and pesticide authorities from the other Basin states also provided information. These combined efforts resulted in developing Table 2-2 showing the percent of acres treated, the rates applied per acre and the major chemicals used. The author, after consulting many reports and interviewing numerous authorities, concluded that the information had sufficient breath of relevancy to permit use in all of the 191 Basin counties. The acreages of the general farm crops were available, by county, from the reports

# CROPS, PERCENT OF ACRES TREATED WITH CHEMICALS, RATES AND KINDS OF CHEMICALS USED (1)

	H=Herbicide I=Insecticide	Percent Acres	Pounds	Some of the Major
Crop(s)	F=Fungicide	Treated	Acre	Chemicals Used
Corn	Н	90	2.75	Atrazine, Alachlor, 2,4-D, Butylate,
	I	20	1.50	Adrin, Bux, Chlordane, Carbofuron, Dyfonate
Grain	Н	60	.50	2,4-D, MCPA, Dinoseb
(wheat, oats, barley, rye)		20	1.00	Carbaryl, Malathion
Soybeans	Н	80	2.00	Trifluralin, Dinoseb, Fluorodifen, Chloramben, Linuron, Alachlor, Chlorbromuron
	I	5	1.00	Carbaryl, Malathion
Field beans	Н	95	2.50	EPTC, Trifluralin, Chloramben, Flurodifen
	I	-5	1.00	Carbaryl, Malathion, Azinphosmethyl
Sugar Beets	Н	95	3.00	Pyrazon, TCA, Phenmedipham, Dalapon, Endothal,
	I	5	1.00	Carbaryl, Patathion, Endosulfan
Hay or grass silage	H	30 25	1.00	EPTC, MCPA, 2,4-DB, Simazine Malathion, Methyoxychlor, Diazinon, Carbaryl, Azinephosmethyl, Methyl Parathion, Imidan
Pastured cropland	H	25	1.00	2,4-D
racered crobtane	I	25	1.00	Carbaryl
Potatoes	Н	90	3.00	Linuron, EPTC, Dinoseb
	I	100	11.50	Phorate, Disyston, Carbaryl, Malathion, Parathion, Azinphosemethyl
	F	100	15.00	Difolatan, Bravo, Dinoseb, Mancozek, Maneb, Zinc, (activated polyethy- lene thiram disulfide)
		70	5.00	Simazine, Paraquat, Terbacil,
Apples	Н	70	11.75	Dichlobenil, 2,4-D Guthion, Imidan, Zolone, Sevin,
	van fartist	0,0	11.75	Phosphamidon, Pluctran, Omite, Kelthane, Gardona
	a F	80	32.00	Benlate, Cyprex, Captan, Difolatan, Polyram, Dikar, Maneb
Sweet cherries	Н	75	4.00	Simazine, Paraquat, Dichlobenil
	I	81	5.00	Guthion, Sevin, Imidan, Parathion
	F	81	5.00	Difolatan, Captan, Dodine, Benomyl, Sulfur, Dichlone
Peaches	Н	60	4.00	Simazine, Paraquat, Terbacil, Dichlobenil
	Sign I	74	6.00	Guthion, Sevin, Parathion, Thiodan, Imidan
	F	74	5.00	Benomyl, Sulfur, Dichlone Simazine, Paraquat, Dichlobenil,
Pears	Н	40	8.00	Diuron Guthion, Thiodan, Parathion, Imidan,
	I	94	1.00	Sevin, Perthane Ferbam, Streptomycin, Bordeaux (coppe
December C =1	F H	40	3.00	Simazine, Paraquat, Dichlobenil
Prunes & plums	I	84	5.00	Guthion, Imidan, Parathion
	F	84	5.00	Benomyl, Dichlone, Sulfur
Strawberries	H	100	10.00	Dipenamid, DCPA, Chlorozuron
D S E MIT W W E & WW	ī	90	12.50	Captan, Thiodan
	F	100	10.00	Captan, Benlate
Blueberries	Н	85	5.00	Simazine, Diuron, Dichlobenil, Paraquat
	I	85	3.25	Guthion, Malathion
Grapes	F H	100 80	41.00	Calcium, Cyanamid, DNOSBP Simazine, Paraquat, Diuron,
	I	90	51.00	Dichlobenil Folpet, Ferbam, Guthion, Captan, Parathion
	F	100	17.50	Ferbam, Phaltan
Sweet Corn	Н	100	2.00	Atrazine, Alachlor, Butylate,
	I	80	13.50	Cyanazine, 2,4-D Parathion, Sevin, Lannate, Cardona, EPM, Dieldrin, Dylox
	F	100	.10	Thiram, Captan

Cantaloupe	oppers,
I   50   2.00   Methoxychlor, Sevin, Thiod Phosphamidon	oppers,
F   90   10.00   Dithiocarbamates, Bravo, Continuant, Captan	
I 90 3.00 Sevin, Dioldrin, Methozych Malathion  F 50 5.00 Dithiocarbamates, Thiram,  Snap beans H 90 2.00 EPTC, Trifluralin, Dinoseb Chloramben  I 50 6.00 Sevin, Patathion, Diazinon Dimethoate  F 75 5.00 Dithiocarbamates, Bravo, Conthiram, Captan  Cabbage H 100 3.00 Trifluralin, Nitrofen, DCP, I 100 4.50 Guthion, Diazinon, Lannate Thiodan, BT  F 75 7.00 Dithiocarbamates, Bravo, Conthiram, Captan  Carrots H 100 2.00 Linuron, Nitrofen  I 100 4.50 Sevin, Parathion, Diazinon Dithiocarbamates, Bravo, Conthiram, Captan Dithiocarbamate	2.4-D
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I 100 6.00 Dasanit, Dyfonate, Diazinon Parathion, Matalhion	,
F 75 10.00 Dithiocarbamates, Bravo, Co	ppers,
Green peppers H 100 3.00 Trifluralin, Diphenamid	THE !
I 100 35.00 Sevin, Dibrom, Systrox, Dim	ethoate,
F 50 10.00 Dithiocarbamates, Coppers, Captan	Thiram,
Tomatoes H 100 3.00 Trifluralin, Diphenamid, Ch I 25 1.50 Diazinon, Lannate, BT, Guth Thiodan	
F 90 10.00 Dithiocarbamates, Copper, B	ravo
Celery H 100 3.00 CDEC, Nitrofen, Prometryne,	
I 100 18.00 Sevin, Parathion, Systrox, Phosdrin	Dibrom,
F 100 16.00 Dithiocarbamates, Copper, B	
Green peas H 100 2.00 Propachlor, Dinoseb, Triflu I 100 2.00 Parathion, Systrox, Dimetho	
Malathion, Diazinon  F 50 6.00 Dithiocarbamates, Copper, B	
F 50 6.00 Dithiocarbamates, Copper, B Watermelon H 80 6.00 Naptalam, Bensulide	MAYER
I 50 2.00 Methozychlor, Sevin, Thioda Phosphamidon	ravo
F 50 10.00 Dithiocarbamates, Bravo, Co	

Many chemical scientists believe that "carry over" in the use of herbicides and "persistence" in the use of insecticides may be largely eliminated in the next five years. This means that some chemicals now in common use will practically disappear and the new ones having low, if any, residues will be emerging.

To Convert From
Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Metric Tons Multiply By 0.454 0.405 907.2 0.907 of the State Statistical Reporting Services (2) except for pastured cropland for which the 1969 Census figures were the most recent available. (3) For vegetables, acreages were obtainable by state (4A) but not by county except in a few instances. (2A) For fruit crops, production figures were available by state but not by county; however, no acreage figures were shown except in a few isolated state reports. (2C,2D)

#### 2.2.3 Chemical Application on Vegetables

The total acres of each of the important vegetable crops in each Basin state were multiplied by the chemical application rates per acre and then divided by the total acres of vegetables in that state obtaining a weighted chemical figure per acre for all vegetables in the state. Table 2-3 illustrates this procedure applied to Wisconsin.

Table 2-3
WISCONSIN VEGETABLE ACRES FOR 1972 AND CHEMICALS APPLIED

77	Total	Herbicides	Insecticides	Fungicides
Vegetable	ACLES	Herbiciaes	2110000110111	
Cantaloupe	500	2,400	500	4,500
Green Peas	122,200	244,400	244,400	366,600
Onions	1,500	18,000	9,000	11,250
Cucumbers	9,000	54,000	13,500	45,000
Cabbage	8,600	25,800	38,700	45,150
Sweet Corn	113,500	227,000	1,225,800	11,350
Tomatoes	1,000	3,000	375	9,000
Snap Beans	45,500	81,900	136,500	170,625
Carrots	2,300	4,600	20,125	17,250
Lettuce	900	5,400	17,100	5,400
TOTAL	305,000	666,500	1,706,000	686,125
Date was				
Rate per acre, 1bs		2.185	5.593	2.250

<sup>1/</sup>In determining the total amounts of herbicides, insecticides and fungicides used, the rates per acre shown in Table 2-2 have been applied only to those acres treated, not to total acres. The rates per acre shown in this table can be applied to total acres as these rates have been proportionately reduced.

To Convert From	To	Multiply By
Pounds (1b)	Kilograms (kg)	0.454
Acres (acre)	Hectare (ha)	0.405

The ratios of vegetable acreages in the Basin states in 1972 compared to 1969 were as follows: New York .85 [59,974 hectares (148,084 acres) in 1969, 51,150 hectares (126,300 acres) in 1972], Ohio .88, Indiana .82, Illinois .85, Minnesota 1.07, Wisconsin 1.00, Pennsylvania .72 and Michigan 1.07. The state ratio times the total vegetable acreage, shown in each county in the 1969 Census, times the composite vegetable chemical rates per acre for each state provides the pounds of herbicides, insecticides and fungicides respectively used on vegetables in each county in 1972.

#### 2.2.4 Chemical Application on Fruits

A similar procedure as used with vegetables was followed for fruit. The recent acres of fruit crops by county was available in Michigan and there was no fruit in the Minnesota counties. In the other states the fruit production figures, stated not in acres but in pounds or tons, were first converted to acres of fruit crops using average yields as the divisors. The chemical usage rates per acre were then applied to these acres to develop composite chemical use rate figures per acre by state for herbicides, insecticides and fungicides used on fruit.

The fruit acres in each county do not experience great fluctuations annually, like vegetable acreages. Therefore, it was assumed that fruit acres per county in 1972 were the same as in 1969. The composite chemical use rates per acre determined above were applied to the county fruit acreage to determine the total quantities of herbicides, insecticides and fungicides used in a county. The composite figures for the amounts of chemicals used per acre of bearing fruit are shown in Table 2-4.

Table 2-4
POUNDS OF CHEMICALS APPLIED PER ACRE BEARING FRUIT

State	Herbicides	Insecticides	Fungicides
New York	4.593	21.109	22.308
Pennsylvania	4.583	16.261	21.860
Illinois	4.800	10.400	25.800
Wisconsin	4.596	9.084	21.327
Ohio	4.663	18.444	25.156
Indiana	4.840	10.962	28.392

To Convert From	To	Multiply By
Pounds (1b)	Kilograms (kg)	0.454
Acres (acre)	Hectares (ha)	0.405

### 2.3 Animal Wastes Methodology

Farmers traditionally have regarded animal manures as useful by-products of livestock farming. Plentiful supplies of commercial fertilizers coupled with the higher costs of farm labor, power and machinery have raised serious economic questions in the minds of farmers as to manure value. An increasing number have been trying to determine how to dispose of their animal manure in the most efficient and least costly manner.

Society has become much more conscious of pollution and the entire area of waste disposal. Natural resource people first looked to the cities and communities with high population concentrations as the major sources for pollution. An increasing awareness has developed that pollution originating from so-called non-point sources may also be a major contributing factor.

One purpose of this study was to try and determine the tons of manure being produced by livestock--cattle, horses, hogs, sheep, chickens and turkeys--in the 191 counties comprising the Great Lakes Basin. For additional information, the amounts of primary nutrients--nitrogen, phosphorus and potash--contained in these manures were calculated.

Information from researchers showed the tons of manure defecated from a dairy cow of certain weight or a hog or a steer or a sheep of certain weights in a particular time span. The United States and State Census and Crop Reporting Publications provide information on livestock numbers. (10) (11) The development of manure factors for various kinds of livestock so that the livestock numbers shown in the Census-Crop Reporting Publications could be directly converted into total tons of manure defecated represents a major contribution of this study.

A careful review of the statistical information involved in this study indicated that if the 1969 Census information was used, conclusions in most instances would be somewhat inaccurate. Comparable information for 1973 or 1974 was not available for many series. The most complete and up-to-date information available for the Nation, states, and counties was for the year 1972. The figures for any one year are subject to limitations—sometimes overstating, sometimes understating. In most instances the statistics for 1972 represent reasonably well the situation today and were thus used in this study.

Animal and animal waste authorities do not share a unanimity of opinion on many items or factors relating to the manure from various classes of livestock. Assistance in this section was received from Dr. James B. Johnson, an Agricultural Economist with the Commodity Economic Division of the U.S.D.A. Economic Research Service.

Manure quantities for all kinds of livestock were first determined and then the quantities of primary nutrients—nitrogen, phosphorus and potash—in the manure were derived. This procedure was simplified some. The tons of animal manure for a livestock class were multiplied by the pounds of each primary nutrient in one ton of manure and then divided by 2000 to get the tons of primary nutrients. For example, the tons of swine manure times 10.0, 2.8 and 7.6 gave the pounds of nitrogen, phosphorus and potash respectively, which

divided by 2000 gave the tons of each in the swine manure. However, if the tons of swine manure were multiplied by 0.0050, 0.0014, and 0.0038 respectively the results represented the tons of nitrogen, phosphorus and potash in the manure. These multipliers are actually the tons of nitrogen, phosphorus and potash in one ton of swine manure. The procedure reduced the number of computations required.

Table 2-5 shows these multipliers for the three primary nutrients for each kind of livestock. These multipliers are not shown in the tables where methods of determining manure quantities for each type of livestock are illustrated. The pounds of primary nutrients are shown in these tables for the various livestock types in the following sections.

Table 2-5
MULTIPLIERS FOR PRIMARY NUTRIENTS

Kind of Livestock	Tons of Manure Produced	X	Tons of Nutrient per Ton of Manure	les as	Tons of Nutrients In Manure
			DE STREET, DES BRITISTS		
Swine	all symmetric	X	.0050	of rushi	mediaval State
II II	ASSESSED TO SELECT	X	.0014	nem = b	Tons of nitrogen
11		X	.0038	=	Tons of phosphorus
		Α	.0036	=	Tons of potash
Cattle		X	.0056	=	Tons of nitrogen
11		X	.0010	=	Tons of phosphorus
11		X	.0050	=	Tons of potash
CL .					
Sheep		X	.0140	==	Tons of nitrogen
11		X	.0021	=	Tons of phosphorus
		X	.0100	=	Tons of potash
Horses		X	.0069	=	Tons of nitrogen
11		X	.0010	=	Tons of phosphorus
11		X	.0060	=	Tons of potash
Poultry		X	0156		
"I	and the latest of	X	.0156	=	Tons of nitrogen
iii		X		=	Tons of phosphorus
		^	.0035	=	Tons of potash
To Convert From			To	Mul	tiply By
	s (1b)		Kilograms (kg)		.454
Tons	(ton)		Kilograms (kg)		.907
			Metric Tons	907.	. 2

There are variables used in the following livestock tables that with more information or additional research may require adjustment. Some of these variables are livestock weights, days on feed, manure production as percent of body weight, and the rates of primary nutrients in the different livestock manures. In addition, changes in classifications or groupings for different kinds of livestock, and availability of better state and county livestock statistics may improve the results.

#### 2.3.1 Cattle Manure Determination

The procedure outlined in Table 2-6 shows the methodology used to establish two cattle manure factors, one for the cows and heifers calved and the other for the heifers, steers, bulls and calves. The United States Department of Agriculture Statistical Yearbooks and the various State Crop Reporting Service Annual Reports show cattle numbers by states for these classes.

The cattle numbers for heifers, steers, bulls and calves were not available by county. Thus, as shown in Table 2-6 these were prorated to each county with 58 percent of the cattle other than cows and heifers allocated to heifers, steers and bulls over 230 kilograms (500 lbs) and 42 percent to calves under 230 kilograms (500 lbs). These same allocations were used for the counties in all the states involved in this study. Had separate factors for each state been developed, the manure factors for cows and heifers calved would have been identical for all eight states. The manure factors for heifers, steers, bulls and calves would have been practically identical for five states and about 2 to 3 percent higher in Ohio, Indiana and Illinois. Thus, the manure factors used for cattle are reasonable, and if anything slightly conservative.

<u>Item</u>	Reference	State	e of Michiga	Ingham County, m Michigan
Statistics A	vailable for a	11 States	and Countie	25
Beef cows & heifers calved	(10A)		194,000	3,400
Milk cows & heifers calved	(10A)		430,000	11,800
Total cows & heifers calved	(10A)		624,000	15,200
Cattle other than cows & hei	fers (10A) (10A)	1	952,000 ,576,000	25,400 40,600
All cattle & calves		-		er than Cows & Heifers
Statistics Available	only on state	D4313 101		
Cattle other than cows & hei	fers		952,000	25,400
Over 500 lbs: Beef heifers	(10A)		44,000	County detailed figure
Dairy heifers	(10A)		175,000	not available. Obtain
Other heifers			66,000	here by breaking down cattle other than cows
Steers Bulls	(10A) (10A)		24,000	in heifers in same pro
Bulls	(IOA)		213000	portion as for state.
Total	(10A)		549,000	14,732
Percent			58%	58%
Calves under 500 lbs - Tota	1 (10A)		403,000	10,668
Perc	ent		42%	42%
Conversion o	f Cattle Numbe	rs to Man	ure Ouantiti	Les
Cows and heifers calved			624,000	15,200
Average weight per animal			1,200	1,200
Total lbs cows and heifers			,800,000	18,240,000
Manure: 1bs per day, 6% of	body wt (1	3)	.06	.06
Lbs. of manure per day Tons of manure per day		44	,928,000	1,094,400
Tons of manure per day		8	22,464	547.2 199,728
Tons per cow and heifer calv	ed	0	13.14	13.14
Cattle over 500 lbs			549,000	14,732
Average weight per animal	(1	2)	800	800
Total lbs of cattle		7	,200,000	11,785,600
Calves under 500 lbs			403,000	10,668
Average weight per animal	(1	2)	300	300
Total lbs of calves			,900,000	3,200,400
Total lbs of other cattle		560.	,100,000	14,986,000
Manure: 1bs per day, 6% of	body wt (1		.06	.06
Lbs of manure per day		33,	,606,000	899,160
Tons of manure per day			16,803	449.58
Tons of manure per year		6,	133,095	164,097
Cattle other than cows and h	eifers		952,000	25,400
Tons per animal		_	6.45	6.45
Determining Quantities of	Primary Nutri	ents in We	et Cattle Ma	nure Pefecated
Tons of wet manure defecated	: Cows:	8.	199,360	199,728
	Other:		133,095	164,097
	Total:		,332,455	363,825
Lbs. of nutrients per ton of wet cattle manure			Tons of nut	rients in manure
NitrogenN11.2 lbs	N		80,262	2,037
PhosphorusP2052.0 1bs	P205		14,332	364
PotashK <sub>2</sub> 010.0 1bs	к20		71,662	1,819
To Convert From	То	Multip	lv Bv	
		0.4		
Tons (ton)	Cilograms (kg) Cilograms (kg) Metric Tons	907.2		

#### 2.3.2 Swine Manure Determination

The procedure outlined in Table 2-7 shows the methodology used to establish a manure factor for swine. Publications from the United States Department of Agriculture and the Statistical Reporting Services for the eight states, provided three swine figures by state and by county: hog and pig inventory on December 1, number of sows farrowing in the spring (December 1 through May 31) and the number of sows farrowing in the fall (June 1 through November 30). The swine manure factor was thus applied to the total number of litters farrowed in each county. The number of litters farrowed is the same as the number of sows farrowing.

Swine is the only livestock class for which different manure factors were determined for different states. The reason for this is that four states in the Basin had a significant in-shipment of feeder pigs in 1972:
Minnesota, 154,000; Ohio, 336,000; Illinois, 362,000; and Indiana, 495,000.
The four counties in Minnesota in the Basin have little swine so no adjustment was necessary. For Ohio, Illinois and Indiana adjustments were necessary. The manner in which these adjustments were handled is illustrated in the accompanying table where a manure factor for Lagrange County, Indiana, was determined. This county fed out 9,393 feeder pigs according to the calculations.

The highest manure factor was determined for Indiana-6.930 kilograms (7.636 tons) per litter. The average weight of hogs marketed in Indiana in 1972 was 115 kilograms (253 lbs), the highest for any Basin state, and the pigs weaned per litter averaged 7.4, as high as in any major swine state. These figures, coupled with the highest feeder pig in-shipment for any Basin state, resulted in the highest manure factor. The manure factor for Ohio was the highest at 7.450. The average weight of hogs marketed was only 104 kilograms (228 lbs), but pigs weaned per litter averaged 7.4 and feeder pig in-shipment was substantial. The manure factor for Illinois was 7.120, the lowest for any Basin state. This was surprising because the average weight of hogs marketed for Illinois was 113 kilograms (249 lbs) and the feeder pig in-shipment was substantial. However, the average number of pigs weaned per litter was just under 7.0, and thus Illinois was the only Basin state with average litter size under 7.0.

The swine manure factor for the other five states--Minnesota, Wisconsin, Michigan, New York and Pennsylvania--was calculated to be 6.560 kilograms (7.230 tons) per litter.

#### DETERMINING MANURE FACTOR FOR SWINE

Item		agrange County
ows farrowing, 1972	(1LA)	18,369
verage number for year50% of above		9,184
otal sow days		3,352,160
THE RESERVE THE PROPERTY OF TH		,
verage weight per sow-lbs.	(13)	425
anure production: 6% of body weight per day	(13)	.06
anure production: per sow per day-lbs		25.5
nure production per year from sowslbs	family after how	85,480,080
igs raised, 1972	i malabic	dust estable
verage number sows per yr. x 7.4 pigs per litter	(10B)	67,965
ays there		365
otal pig days		24,807,225
verage weight per market hoglbs	(10C)	253
verage weightbirth to market weightlbs	-	126
anure production: 6% of body weight per day	(13)	.06
mure production: per pig per daylbs		7.56
anure production per year from pigs raisedlbs		187,542.621
eder Pigs raised, 1972	L.I send st	ALL COMPANY
Estribution of feeder pigs raised assumed to be s		ows and pigs
aisedfor which county information is available	•	
ows farrowed, State of Indiana, 1972	(11A)	968,000
ws farrowed, Lagrange County, 1972 ercent farrowed in Lagrange County	(11A)	18,369 .018976
eeder pig in-shipment into Indiana in 1972	(10D)	495,000
ercent estimated fed out in Lagrange County		.018976
mber estimated fed out in Lagrange County, head		9393
erage weight per market hog1bs	(10c)	253
verage weightwhile on farm		127
nure production: 6% of body weight per day	(13)	.06
nure production: per hog per daylbs		7.62
ad fed out in county		9393
ys on feed: estimated by swine specialists		105
eder hogs: days on feed		986,265
nure production, per hog per daylbs		7.62
nure production from feeder pigs raised, lbs	- (5)	7,515,339
ummary - 1972		
anure production from sowslbs		85,480,080
anure production from pigs raisedlbs		187,542,621
anure production from feeders raised—lbs		7,515,339
otal manure production from all swinelbs		280,538,040
otal manure production from all swine-tons		140,269
itters farrowed in Lagrange County, 1972		18,369
mure productiontons per litter farrowed		7.636
Determining Quantities of Primary Nutrients in	n Wet Swine M	anure Defecat
ons of wet manure defecated		140,269
	Tons of nutr	ients in manure
os. of nutrients per top of wet swipe manura	or muli	Lenes in manure
NitrogenN10.0 lbs PhosphorusP <sub>2</sub> O <sub>5</sub> 2.8 lbs	701 196	

To Convert From

To

Multiply By

Pounds (1b) Tons (ton)

Kilograms (kg) 0.454 Metric Tons 1.7 0.907

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#### 2.3.3 Sheep Manure Determination

Sheep do not represent a major type of livestock in the Great Lakes Basin. However, the process of determining a manure factor for sheep is no less complicated than for other livestock types. The procedure outlined in Table 2-9 shows the methodology used. The Statistical Reporting Services for each of the eight states showed a sheep and lamb inventory as of January 1 by counties. This was the only county figure available; thus, the sheep manure factor had to be developed from this figure. The United States Department of Agriculture provides a number of statistical series for sheep by states. The sheep and lamb inventory is a combination of stock sheep and sheep on feed. The lamb crop for each state can be computed by multiplying the percent of lambs saved times the ewes one year old and over. The lamb crop for each county can then be computed.

A different manure factor could have been determined for each state. The figures in Table 2-8 show substantial state variations in the percents of breeding stock and lamb crops in respective sheep and lamb inventories. Had this been done, the sheep manure factor for Ohio, the major sheep state in the Basin, would have been 1.52 kilograms (1.68 tons) of manure per sheep and lamb inventory animal instead of the 1.46 kilograms (1.61 tons), the manure factor used for sheep throughout the Basin.

Table 2-8

PERCENT OF BREEDING STOCK IN SHEEP AND LAMB INVENTORY

Sheep & Lamb Inventory		Breeding	Stock	Lamb Crop	
State_	Thousands	Number Thousands	Percent of Inventory	Number Thousands	Percent of Inventory
Ohio	627	519	83	479	76
Indiana	235	210	89	191	81
Illinois	275	230	84	198	72
Minnesota	437	330	76	332	76
Wisconsin	123	108	88	108	88
Michigan	221	176	80	154	70
New York	98	85	87	72	73
Pennsylvania	144	144	100	111	77

Michigan had the lowest percent figures for both breeding stock and lambs, thus the manure factor of 1.61 determined for Michigan and used for the other seven states was conservative—as low as any state would have factored out. On the other hand, the actual 1.68 figure for Ohio was only 4 percent higher than this, and no state would have run more than 5 percent higher.

Three states had more than 25,000 head of lambs shipped in to be fed out. These were not included in the determinants. Ohio had 36,000 head shipped in but this was not significant considering that the total breeding stock and lamb crop was about a million head. Minnesota had 147,000 head shipped in but these were not fed out in the Basin counties. Illinois shipped in 100,000 head. Had these been included the factor for Illinois would have been 1.540 kilograms (1.70 tons) per animal or about 5 percent higher than 1.61. However, there was no way to account for the location of where these were fed out in Illinois, their length of time there, or their weights.

Table 2-9

DETERMINING MANURE FACTOR FOR SHEEP

<u> Item</u>		Reference	State of Michigan	Ingham County, Michigan
Sheep and lamb inventoryend of 1	.972	(10E)	221,000	9,100
Breeding stock sheep Percent breeding stock is of inven		(11B)	80	(computed) 7,280 80
Days breeding stock there Breeding stock sheep days (stock s		5)	365 64,240,000	365 2,657,200
Average weight of breeding stock, Manure per day per animal, % of bo	lbs ody weight	(16) (17)	140 .07 9.8	140 .07 9.8
Manure per animal per day, 1bs Manure from breeding stock, 1bs Manure from breeding stock, tons			629,552,000 314,776	
Ewes, 1 year and over Lambs saved as percent of ewes	4.14	(10F) (10G)	107	(computed)5,953 107
Lamb crop saved Percent lamb number is of inventor	ry, %	77.7	154,080 70 150	(computed) 6,370 70 150
Number of days average lamb on fee Number of lamb days on feed	ed	(16)	23,112,000	
Weight of lamb sold, 1bs. Average weight during 150 day fee	ding	(16)	100	100
period, 1bs Manure per lamb per day, % of bod		(17)	50 .07 3.5	
Manure per lamb per day, 1bs Manure from lambs, 1bs Manure from lambs, tons			80,892,000 40,446	3,342,250
Manure from breeding stock, tons Manure from lambs, tons			314,776 40,446	1,672
Manure from sheep and lambs, tons Manure per sheep & lamb on invent	ory, tons		355,222 1.61	4 /1
Lbs of nutrients per ton wet she	eep manure	(14)	Tons of nu	trients in manur
Nitrogen-N28.0 lbs PhosphorusP <sub>2</sub> 0 <sub>5</sub> 4.2 lbs PotashK <sub>2</sub> 020.0 lbs	Department of the state of the	tor (Louise) tor Oracle of the Objects	4,973 746 3,552	31
To Convert From	To		Multiply By	
Tons (ton) K	ilograms ( ilograms ( etric Tons	(kg)	0.454 907.2 0.907	

#### 2.3.4 Horse Manure Determination

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L47 The process of determining manure quantities for horses was difficult because information regarding numbers of horses was extremely limited. The 1964 U.S. Agricultural Census did not show horse numbers. The figures in the 1969 Census included only those used on farms, thus numbers were substantially understated. The manure produced per horse is roughly comparable to that produced per cow. With each animal producing this quantity, the significance of having the horse numbers as accurate as possible is evident.

The horse numbers used were obtained in different ways for the respective states, and in a few instances different approaches were used for counties within a state.

Michigan: The Michigan State Crop Reporting Service in cooperation with the Horse Specialist at Michigan State University conducted a statewide equine survey in 1971 showing numbers by county. This survey included all horses both on and off the farm. The study was updated in 1972. This is probably the most complete and accurate information available, not only to show the location of all horses within the state but also to show the trend in horse numbers generally. The 1972 state total of all horses numbered 205,302 compared to 53,869 head of horses on farms as shown in the 1969 Census for Michigan. This is an increase of 3.81 times. County increases varied around this figure.

Illinois: The 1969 Census showed 72,501 horses on farms in Illinois with 7,982 in the six Basin counties. The Horse Extension Specialist at the University of Illinois estimates that there are now between 250,000 - 500,000 horses kept for all purposes in the state. He estimated that perhaps half of these might be in the six Basin counties. If this were true, it would mean that there are 30-60 times as many total horses now as the census figures showed on farms for 1969 in these counties. For this report, a mid-figure of 375,000 (halfway between 250,000 and 500,000) was used as the number of all horses for the state. These were then allocated to the respective six Basin counties at the same ratio to the state total as shown in the 1969 Census. This meant that 41,268 horses were assigned to these counties or 5.17 times as many as in the 1969 Census.

Ohio: The Horse Extension Specialist in Ohio conducted an equine survey for the state in 1971. The horse numbers shown for the Ohio counties are from this survey as of July, 1971. They are believed to be understated by at least 10 percent or more in this report.

<u>Wisconsin</u>: Dr. Ray Antoniewicz handles the horse projects for the University of Wisconsin Cooperative Extension and provided the estimates of horse numbers as shown for the Wisconsin counties.

<u>Indiana</u>: The 1972 Indiana Crop and Livestock Annual Summary showed the number of horses and ponies by county in 1972 assessed for taxation. The number of horses and ponies shown in this 1972 report for Starke County, for example, was 51. The number shown in the 1969 Census was 301. It was believed that

using the trend in horse numbers based on the Michigan study would better represent the Indiana situation than using the Indiana annual summary. The 1972 figures used for Indiana counties were those shown in the 1969 Census times 3.81 (based on the overall state increase for Michigan).

New York: Information for 12 counties was available through Dr. S. W. Sabin, Associate Professor of Animal Science Extension at Cornell, from information developed by County 4-H Extension Agents. These figures were used in this study. There were sufficient variations in the responses to suggest that it might be more reliable to use the Michigan study as a basis for the other thirteen New York counties where information was not provided by Extension Agents.

Pennsylvania: No information was available as to horse numbers in Erie County--the only Great Lakes Basin county in Pennsylvania. The Michigan study was used as the basis for determining the 1972 horse numbers in Erie County.

The procedure outlined in Table 2-10 shows the methodology used to determine a manure factor for horses.

Table 2-10
DETERMINING MANURE FACTOR FOR EQUINE (HORSES AND PONIES)

<u>Item</u>	Reference	State of Michigan	Ingham County Michigan
Horses and ponies, 1972	(18)	205,302	5,028
Days there per year		365	365
Total horse days		74,935,230	1,835,220
Average weight per animal, 1bs	(19)	1,000	1,000
Total horse lbs per year		74,935,230,000	1,835,220,000
Manure/horse/day: 7% of body wt	(19)	.07	.07
Manure, total 1bs produced		5,245,466,100	128,465,400
Manure, total tons produced		2,622,733	64,233
Manure, tons per animal		12.78	12.78
Determining Quantities of	Primary Nu	trients in Horse Man 2,622,733	64,233
Tons of wet manure defecated		2,622,733	
COLUMN TARGET		2,622,733 (14) <u>Tons of nu</u>	64,233 trients in manur
Tons of wet manure defecated  Lbs. of nutrients per ton of hornitrogenN13.8 lbs  PhosphorusP <sub>2</sub> 0 <sub>5</sub> 2.0 lbs		2,622,733	64,233
Tons of wet manure defecated  Lbs. of nutrients per ton of hornitrogenN13.8 lbs		2,622,733 (14) <u>Tons of nu</u> 18,097	64,233 trients in manua
Tons of wet manure defecated  Lbs. of nutrients per ton of hornitrogenN13.8 lbs  PhosphorusP <sub>2</sub> 0 <sub>5</sub> 2.0 lbs		2,622,733 (14) <u>Tons of nu</u> 18,097 2,623	64,233 trients in manur 443 64 385
To Convert From	rse manure	2,622,733  (14) <u>Tons of nu</u> 18,097 2,623 15,736 <u>Multiply</u>	64,233 trients in manur 443 64 385
Tons of wet manure defecated  Lbs. of nutrients per ton of hornitrogen-N13.8 lbs  Phosphorus-P <sub>2</sub> 0 <sub>5</sub> 2.0 lbs  PotashK <sub>2</sub> 012.0 lbs	rse manure	2,622,733  (14) <u>Tons of nu</u> 18,097 2,623 15,736 <u>Multiply</u> (kg) 0.454	64,233 trients in manur 443 64 385

#### 2.3.5 Chicken Manure Determination

The procedure outlined in Table 2-11 shows the methodology used to establish a manure factor for chickens (hens, pullets, roasters, broilers). The U.S. Department of Agriculture and the Statistical Reporting Services for the eight states provided figures by state and by county showing the number of hens and pullets of laying age on farms. There were a number of other poultry series available by state but not by county. The manure factor for chickens was thus equated with the number of hens and pullets in this study.

There were sizable industries in some of the Basin states involving poultry meat production. Pennsylvania was by far the largest with 60 million broilers a year. However, only one Pennsylvania county is in the Basin. Ohio, Indiana,

Wisconsin and Minnesota each produced 11 to 14 million broilers a year and New York nearly two million. Only Illinois produced less than one-half million a year. While these numbers were substantial, they did not represent a major factor in overall chicken manure production because of the small amount produced per broiler. Had broiler numbers been included for the heavier Basin broiler states, the manure production shown at 37.6 kilograms (82.90 lbs) per bird would have increased no more than one-tenth pound, raising manure production per bird to 37.7 kilograms (83 lbs.). This does not represent a sufficient amount in terms of either manure or primary nutrient quantities to justify calculating different factors for each of the states.

Table 2-11
DETERMINING MANURE FACTOR FOR CHICKENS

true are but are described and and the same for	Reference	s State of Michiga	n
Hens and pullets, 1972	(10H)	6,621,000	
Days there per year		365	
Hen and pullet, days		2,416,665,000	
Average weight per hen, 1bs	(20)	4.5	
Manure production: percent of body w	t (12)	.05	
Manure production: lbs per bird per		.225	
Manure production: total lbs produc		543,749,625	
Manure production: total tons produc	ed	271,875	
Broilers and roasters, 1972	(10H)	566,000	
Days to raise	(2011)	70	
Broiler and roaster, days		39,620,000	
national and an arrange to a	(and the later of		
Average wt per bird marketed, 1bs Average wt per bird during feeding	(20)	5.20	
period: 1/2 of above		2.60	
Manure production: percent of body w	t (12)	.05	
Manure production: lbs per bird per		.13	
Manure production: total lbs production		5,150,600	
Manure production: total tons produce		2,575	
		THE PERSON	_
Manure: hens and pullets, totallbs		543,749,625	
Manure: broilers and roasters, total	-lbs	5,150,600	
Manure: total productionlbs		548,900,225	
Manure: total production-tons		274,450	
Manure: 1bs per hen and pullet	the remaining	82.90	
Determining Quantities of Primary	y Nutrients in Ch	nicken Manure	
Manure: total productiontons	or species to be because of the beauty of th	274,450	
a militation of a sanition to be record	nanure (14) <u>T</u> o	274,450	nur
Manure: total productiontons	nanure (14) <u>To</u>	Charmon S. C. III	nur
Manure: total productiontons  Lbs of nutrients per ton of chicken r	nanure (14) <u>To</u>	ons of nutrients in ma	anur
Manure: total productiontons  Lbs of nutrients per ton of chicken resolutionN31.2 lbs  PhosphorusP2058.0 lbs		ons of nutrients in ma 4,281 1,098	inur
Manure: total productiontons  Lbs of nutrients per ton of chicken resolved in the second se	2	4,281 1,098 961 Multiply By	nur
Manure: total productiontons  Lbs of nutrients per ton of chicken reserved in the served in the se		4,281 1,098 961	nur

# 2.3.6. Turkey Manure Determination

The procedure outlined in Table 2-12 shows the methodology used to establish manure factors for turkey hens and for turkeys raised. The United States Department of Agriculture and the State Statistical Reporting Services provided numbers on these two series by state but not by county.

Letters were written to the Poultry Science Departments and the Agricultural Economics Departments at the land grant universities in each of the eight states requesting numbers of turkey hens and turkeys raised, especially by county. The following replied:

Lee F. Schraeder----Purdue University, Indiana
S. W. Sabin------Cornell University, New York
Melvin L. Hamre-----University of Minnesota, Minnesota
Olan D. Forker-----Cornell University, New York
Ralph L. Baker-----Ohio State University, Ohio
Henry Larzelere-----Michigan State University, Michigan
Hugh S. Johnson------University of Illinois, Illinois
Louis C. Arrington----University of Wisconsin, Wisconsin

Some showed a breakdown between turkey hens and turkeys raised. Others provided just one figure. A careful review of the statistics received, coupled with consultation with Michigan State University staff members, suggested using the following approach. If the authorities assigned no turkeys to a county we assigned no turkeys; if they showed a breakdown we used the breakdown provided; if they provided just one figure for the number of turkeys we used this figure for turkeys raised and added an additional ten percent of this number for turkey hens.

The manure from turkeys was not an important item for the Basin counties in general. It was an important factor in certain counties. For example, it was estimated that in Michigan about 45 percent of all turkeys were raised in Ottawa County, 25 percent or more in Allegan, about 10 percent in each of Barry and Antrim with the remaining 10 percent in all the other counties.

The manure production from turkeys was assumed to be 5 percent of body weight, the same as used for chickens. The weight per turkey raised, according to the statistics, showed variations in pounds per bird between the states. This difference did not appear to be sufficiently significant to be recognized in this report. All turkeys regardless of where raised were considered to be 10.9 kilograms (23.9 lbs) in weight.

Table 2-12
DETERMINING MANURE FACTOR FOR TURKEYS

<u>Item</u>	Reference	State of Michi	gan
Turkey breeder hens, 1972 Turkey hen days, per bird Turkey hen days, total	(101)	90,000 365 32,850,000	
Weight of breeding hen, average 1bs Manure production per hen: 5% of body wt Manure production per hen per day, 1bs Manure production, total 1bs produced Manure production, total tons produced Manure production, 1bs per hen per year	(20) (21)	20 .05 1.00 32,850,000 16,625 365	
Turkeys raised, number Days to raise and finish Turkeys raised, days	(10J)	1,089,000 150 163,350,000	
Weight per turkey raised, average lbs Average weight: hatching to market, lbs Turkeys raised, total lbs	(10J)	23.9 11.95 1,952,032,500	
Manure production, % of body weight Manure production, tons per year Manure production, lbs per bird per year	(21)	.05 48,801 89.63	
Manure production, total tons	L Local Com	65,226	
Lbs of nutrients per ton of turkey manure	(21)	Tons of nutrients	in manure
NitrogenN31.2 lbs PhosphorusP2058.0 lbs PotashK207.0 lbs		1,081 261 228	
To Convert From To	In the Eve	Multiply By	
Pounds (lb) Kilograms (k Tons (ton) Kilograms (k Metric Tons		0.454 907.2 0.907	

## 2.4 Commercial Fertilizer Methodology

Commercial fertilizer consumption, as used in this study, represents all commercial fertilizer materials and products sold or shipped for farm and non-farm use as fertilizer. Materials used in the manufacture of registered mixes or for uses other than fertilizer are excluded.

There were 2.49 million metric tons (2,744,528 tons) of commercial fertilizer or about 7 percent of the United States tonnage consumed in the 191 Great Lakes Basin counties in 1972 (22). This study showed the relative amounts that were solid and liquid. It also showed the amounts of primary nutrients—namely, nitrogen (N), phosphorus  $(P_2O_5)$  and potash  $(K_2O)$ — in the fertilizer. The amounts of micronutrients sold for fertilizer in the Basin counties were not known. If the percentage relative to national consumption was the same as for all commercial fertilizers, the following estimates would have been reasonable—copper — 50 tons; iron — 100 tons; manganese — 800 tons; zinc — 1300 tons; and molybdenum — 10 tons. (One ton = 0.907 metric ton)

The United States Department of Agriculture and the eight State Statistical Reporting Service Annual Summaries provided fertilizer statistics nationally and for a number of series by state. For five states -- Illinois, Indiana, Ohio, Pennsylvania and Minnesota -- county fertilizer information was available. For the other three states -- Wisconsin, New York and Michigan -- the 1972 county information had to be calculated.

Illinois: Two fertilizer tonnage reports were published—one showing information for January — June, 1972 and the other for July — December, 1972. These showed total tons, tons liquid and tons of respective primary nutrients by county. (23)

Indiana: Two fertilizer tonnage reports were published, one showing ratios and grades by county for the spring and the other for the fall of 1972. These reports showed total tons, tons liquid and tons of respective primary nutrients by county. (24)

Ohio: An annual fertilizer sales report was published showing total tons of fertilizer used by county as well as the tons liquid and the tons of respective primary nutrients. (25)

Pennsylvania: A report was available showing total tons of fertilizer used in Erie County in 1972 as well as the tons of respective primary nutrients. The percent liquid was calculated from the Pennsylvania State Summary provided by the Tennessee Valley Authority.

Minnesota: Information on total tons was provided from the Minnesota Statistical Reporting Service. The percent liquid and the amounts of primary nutrients were provided by the United States Department of Agriculture and the Tennessee Valley Authority.

Wisconsin, New York, Michigan: Fertilizer usage by county had to be calculated for these three states. The procedure for calculating the information was important because 73 percent of all Great Lakes Basin counties are located in these states.

The fertilizer used on Class I-V farms in 1969 by county was available for all states in the United States Agricultural Census. The fertilizer used in 1972 by state was available from both the United States Department of Agriculture and the Tennessee Valley Authority. The manner of distribution - whether bagged, bulk or liquid - as well as the amounts of primary nutrients in the fertilizer were also available by state.

This made it possible to calculate the tons of fertilizer used, the amounts liquid and the amounts of primary nutrients by county in the three Basin states where county information was not available. The figures for these three states are shown in Table 2-13.

Table 2-13

TONS OF FERTILIZER USED AND TONS OF PRIMARY NUTRIENTS, 1972

						Winhi	con
<u>Item</u>	Reference	e Wisc	onsin	New Y	ork	Michi	gan
On I-V Farms, 1969, tons On All Farms, 1972, tons	(27) (28)	606,		391,4		595,1 942,5	
		Tons	Percent	Tons Pe	ercent	Tons Pe	ercent
Bagged Bulk Liquid	(29) (29) (29)	260000 501000 181000	53	442000 137000 45000	22	302000 488000 152000	52
Tons used in 1972/ton in	1969	1.55		1.60		1.60	
Primary nutrients: Percent of total fertili	zer	52		39		50	
Primary nutrients, tons		492	,583	245,	741	467,	521
		Tons	Percent	Tons P	ercent	Tons P	ercent
Nitrogen - N Phosphorus - P <sub>2</sub> <sup>0</sup> <sub>5</sub> Potash - K <sub>2</sub> <sup>0</sup>	(28)	129,089 135,847 227,647	26 28 46	77,197 90,468 78,076	31 37 32	153,744 148,185 165,592	33 22 35
		m-		Mil	ltipl	v Bv	
To Convert From		To		ric			
Tons (ton)		llograms etric to			907.2		

## 2.5 Lime Methodology

The amount of agricultural limestone used in the United States in 1972 was 21.4 million metric tons (23.6 million tons).(30) Thirty-three percent of this was used in the eight Great Lakes Basin states. The actual tonnage used in the 191 Basin counties was less than this, of course. The National Limestone Institute, with a possible biased view, states that the State Agricultural Extension Services and the United States Department of Agriculture Soil Conservation Service list 80.3 million metric tons (88.5 million tons) as the annual amount actually needed on our land. This represents a quantity 375 percent of our present annual use.

It would seem that lime usage information might be readily available but this is not the situation. No meaningful limestone information is available from either the United State Department of Agriculture agricultural statistics reports or from most of the State Statistical Reporting Services. The United States Department of Agriculture Agricultural Stabilization and Conservation offices provided information showing the tons that the government cost-shared only but not the total tons applied.

Ohio: This state was an exception. Information was available showing the total tons of liming materials distributed by county for each of the three years 1971, 1972 and 1973(31). These figures are shown for each of the Ohio counties in the Ohio county inventory tables. Table 2-14 shows the tonnage grades for the liming materials used in Ohio for 3 years.

Table 2-14

LIME TONNAGE DISTRIBUTED IN OHIO

to a little	19	971	19	972	1974		
Grade	Tons	Percent	Tons	Percent	Tons	Percent	
Carandnaa	36,661	3	47,607	5	37,575	3	
Screenings	55,452	4	49,104	5	72,713	5	
Meal	894,859	65	618,695	61	800,010	62	
Ground	372,977	27	272,058	27	361,232	28	
Pulverized	8,793	.1	13,217	1	10,482	1	
Superfine Hydrate	4,298	0	6,345	1	7,480	1	
TOTAL	1,373,040	100	1,007,026	100	1,289,492	100	

To Convert From	<u>To</u>	Multiply By
Tons (ton)	Kilograms (kg) Metric Tons	907.2 0.907

Michigan: Liming material applied by county was obtained from the Michigan Agricultural Stabilization and Conservation Office (32). The tons cost-shared and not cost-shared were available by county for the one year only, namely, 1972. Table 2-15 shows the kinds of liming materials applied. Ground limestone represented 82 percent of the total, marl 16 percent and the other forms 2 percent

Table 2-15
LIMING MATERIALS APPLIED IN MICHIGAN, 1972

	Tons	of Limestone Equiv	valent
Kind	Cost-Shared	Not Cost-Shared	Total
Ground Limestone	202,619	140,011	342,630
Mar1	39,574	26,849	66,423
Other:			
Calcareous earth	0	750	750
Papermill refuse	1,152	5	1,157
Carbite refuse lime (CHL)	649	1,617	2,266
Carbite hydrated lime (CH)	852	272	1,124
Sugar refuse lime	515	496	1,011
Other Total	3,168	3,140	6,308
TOTAL	245,361	170,000	415,361
Percent	59%	41%	100%

Minnesota and Pennsylvania: S. N. Peterson, Minnesota, and Kenneth Boger, Pennsylvania, representing their Agricultural Stabilization and Conservation Service offices provided the lime tonnages used in 1972 for these states.

Kilograms (kg)

Metric Tons

907.2

0.907

Tons (ton)

ent

Wisconsin, Indiana, Illinois, New York: The lime tonnages were shown in the 1969 county census reports for all the Basin counties. It was necessary to use this information in these four states only. The county tonnages were multiplied by a ratio figure for each state representing the state tonnages in 1972 compared to the census tonnages in 1969. For example, the Illinois State Tonnage for 1972 was 3.0 million metric tons (3.3 million tons) compared to 2.5 million metric tons (2.8 million tons) in the 1969 Census—giving a ratio of 1.177. Similar factors for other states were: Wisconsin—1.167; New York—1.080; and Indiana—1.100. William F. Johnson, Indiana, and Raymond D. Lett, Illinois State Agricultural Stabilization and Conservation offices, provided the cost—shared lime tons for their Basin counties.

# 2.6 Road Deicing Salts Methodology

Information showing the quantities of salts used for road deicing on a county basis is difficult to find or to arrive at. The salt companies would not provide any information as to the quantities of salts used. The Road and Highway Library publications provided no recent statistics (33). The County Road Association could provide no help or figures. Information and general guidance on how to proceed with this study was received from staff people in the Michigan State Highway Department.

The following persons in the State Highway or State Departments of Transportation provided a tabulation of salts applied to the Basin counties in their respective states:

Louis G. O'Brien - Pennsylvania
George M. Briggs - New York
Ronald Zook - Ohio
P. F. Gibson - Indiana
Edward J. Kehl - Illinois
G. T. Landness - Wisconsin
Frank W. Kuhfold - Minnesota

Each letter, however, contained a statement something like this, "This tabulation is for salt applied to state highways only. Salt applied to county and town or municipal highways is not included as this information is not available to this office."

The Michigan Highway Department provided information from their files showing the tons of road deicing salts purchased through the Michigan State Highway Department and used in each of the 83 Michigan counties for year 1972-73. It was a consensus opinion on the part of staff people contacted there that this tonnage represented 100 percent of the salts used by the State on Federal and State highways in each county, about half of that used by the counties on Federal and State highways in their counties and about thirty percent of that used by municipalities within the counties. For example, the total salts purchased through the Michigan State Highway Department for 1972-73 (season usually December 1 through April) were: State purchases--238.8 metric tons (263,251 tons). County purchases--80.3 metric tons (88,494 tons) and Municipal purchases -- 33.7 metric tons (37,164 tons) for a total of 352.8 metric tons (388,909 tons). When the County purchases were doubled and the Municipal purchases multiplied by 3-1/3, it gave a total of 511.7 metric tons (564,119 tons). The Michigan Highway officials felt that this represented the most likely tonnage applied.

It was possible to obtain county information for Michigan for 3 years, 1970-71, 1971-72, and 1972-73. It was also possible to obtain the "Tons of Salts Applied Per 'E' miles of Highway" for each of these 3 years. An "E" mile of highway is equivalent to a mile of two-lane highway.

Information was provided by each of the other Basin states as to the quantities of salts applied to state highways only by county.

The same procedure as used in Michigan to determine the total salt tons applied per county was used in the other Basin states. It is believed that the results represented to a reasonable degree the road salts applied in the Great Lakes Basin. The index developed to show the amount of road salts applied in each area or subarea, as compared to the U.S. Great Lakes Basin as a whole, used the amount per acre for the total land acres and not for the harvested acres.

#### Section 3

## MATERIALS USAGE IN THE GREAT LAKES BASIN

## 3.1 Study Area

The Great Lakes Basin representing the United States side encompasses 191 counties located in eight states. The Agricultural Census for the United States either does not provide the data or combines the information so that census statistics for four counties in the Basin are not reported as such. These counties are: Keweenaw and Crawford in Michigan, Cook in Minnesota and Menominee in Wisconsin. Thus, the information presented in this report is based on 187 counties, rather than the total 191 counties. The Basin is divided into five major areas, one for each of the five Great Lakes. Those counties bordering on or draining into Lake Superior are in Plan Area 1.0: similarly, Lake Michigan counties are in 2.0; Lake Huron 3.0; Lake Erie 4.0, and those bordering or draining into Lake Ontario area 5.0.

Each Lake Basin Plan Area is further divided into Planning Subareas as follows: Area 1.0 is divided into Subarea 1.1 and Subarea 1.2; Area 2.0 into four Subareas: 2.1, 2.2, and 2.3 and 2.4; Area 3.0 into two Subareas: 3.1 and 3.2; Area 4.0 into four Subareas: 4.1, 4.2, 4.3 and 4.4; and Area 5.0 into three Subareas: 5.1, 5.2, and 5.3. This means the Great Lakes Basin is divided into 5 major Plan Areas which in turn are subdivided into 15 Planning Subareas. The Subareas are then represented by the 191 counties.

## 3.1.1 Agricultural Characteristics

Agriculture within the Basin is widely varied. The land area in the Great Lakes Basin (187 counties) encompasses over 33 milltion total hectares (82 million acres), with 13 million hectares (33 million acres) in farmland, 10 million hectares (24 million acres) in farm cropland and 7 million hectares (17 million acres) in harvested farm cropland. This vast and varied expanse of land begins with the cut-over and forest lands on the Canadian border at the west end of Lake Superior. It extends south through Wisconsin dairy land into the cornbelt then northeast including all of Michigan and east through Indiana and Ohio. Finally, it hugs the Lakes continuing through the dairy, fruit and vegetable regions of Pennsylvania and New York, ending at the Adirondacks. With this type of situation, generalizations are hard to provide, and summaries and comparisons are very difficult to make representative and meaningful. The trends and projections provided could have been improved if time and resources had permitted greater input on the part of the respective states people and on the part of competent and knowledgeable personnel at the local and county levels.

## 3.1.2 Materials Usage

An inventory and analysis on materials usage was made based on personal interviews, correspondence and statistics as available from agricultural statistics, census information, state highway departments, universities, private companies, and state and federal agencies. (1) Background for the analysis is presented in the methodology section. Tables 3-1 to 3-5 summarize the findings of this inventory and analysis. Detailed statistics are shown on Table 3-6.

## 3.1.2.1 Agricultural Chemicals

Higher labor and machinery costs have been important factors in encouraging farmers to increase the use of chemicals in the eradication or control of weeds, insects and diseases. This use of chemicals in agricultural production has been of major concern and on occasion has prompted severe criticism.

One of the major criticisms of chemical use has been the amount of residues remaining after certain chemicals have been used. It is believed now that "carry over" in the use of herbicides, and "persistence" in the use of insecticides will be progressively reduced and largely eliminated in the next 5 years. Some of the chemicals now in common use will practically disappear while those with very low if any residues will be emerging.

For the Basin as a whole, there was a total of 20,588,677 kilograms (45,449,620 lbs). Herbicides accounted for 60 percent, insecticides 25 percent, and fungicides 15 percent of the chemicals used. This amounts to 1.02 kilograms (2.66 lbs) of chemicals applied per acre of harvested cropland. This index was compared to each lake basin and it was determined that Lake Michigan and Ontario basins were the only ones above the average amount of 1.02 kilograms (2.66 lbs), Lake Michigan using 1.24 kilograms (2.75 lbs) and Ontario 1.38 kilograms (3.05 lbs).

### 3.1.2.2 Animal Wastes

It is estimated that the amount of wet manure produced annually in the Great Lakes Basin is approximately 52,389,331 metric tons (57,748,381 tons). Of this amount, cattle produce 79 percent, horses 10 percent, swine 6 percent, sheep 2 percent, and poultry the remaining 3 percent. The amount of primary nutrients in this manure amounts to 1.2 percent of the total, or 640,513 metric tons (706,033 tons).

As an overall average, there are 3057 kilograms (3.37 tons) of manure per harvested acre in the Basin and 37.1 kilograms (82 lbs) of primary nutrients per harvested acre. Lake Ontario basin has the highest average using this index, followed in descending order by the Lake Superior, Michigan, Huron, and Erie basins.

Table 3-1
CHEMICALS USED BY CLASS AND BY HARVESTED CROPLAND ACRE

Subare and	Herbici	des	Insectic	ides	Fungici	de	Total Che	emicals Use		Chemicals per	
Area	CWT	%	CWT	%	CWT	%	CWT	Pounds	Tons	Pounds	Index
	055 /	46	898.6	43	219.4	11	2073.4	207340	104	1.18	44
1.1	955.4		458.0	44	177.0	17	1035.0	103500	52	1.16	44
1.2	400.0	39	1356.6	44	396.4	12	3108.4	310840	156	1.18	44
1.0	1333.4					4.4	10070 /	10070/0	2449	2.20	83
2.1	25860.5	53	16359.7	33	6759.2	14	48979.4	4897940		2.21	83
2.2	34250.9	77	7897.4	18	2239.7	5	44388.0	4438880	2219		123
2.3	52864.7	57	23620.0	26	16078.5	17	92563.2	9256320	4628	3.27	
2.4	7499.2	34	6866.4	31	7630.4	35	21996.0	2199600	1100	4.45	168
	120475.3	58	54743.5	26	32707.8	16	207926.6	20792660	10396	2.75	103
	017/ 0		1129.7	29	643.6	16	3948.2	394820	198	2.02	76
3.1	2174.9	55		14	2433.9	7	37046.2	3704620	1852	2.52	95
3.2	29407.5 31582.4	79	5204.8 6334.5	15	3077.5	8	40994.4	4099440	2050	2.46	92
3.0	31302.4	1.1	0554.5								
	17/05 7	75	4513.5	19	1458.7	6	23597.9	2359790	1180	2.21	83
4.1	17625.7	75	10168.9	13	3350.6	4	79542.8	7954280	3977	2.09	79
4.2	66023.3	83	1876.8	27	1378.0	19	7026.8	702680	351	2.25	85
4.3	3772.0	54		50	9786.8	30	32278.0	3227800	1614	6.82	256
4.4	6393.7 93814.7	20 66	16097.5 32656.7	23	15974.1	11	142445.5	14244550	7122	2.52	95
4.0	93014.7	00	32030.1								117
F 1	7035.9	40	5070.8	29	5583.5	31	17690.2	1769020	885	3.11	117
5.1		35	12744.2	34	11727.5	31	37424.9	3742490	1871	3.78	142
5.2	12956.2	- 100 m	1683.2	34	74.0	2	4903.2	490320	245	1.19	45
5.3	3146.0	64	19498.2	32	17385.0	29	60021.3	6002130	3001	3.05	115
5.0	23138.1	39	19490.2	32	17303.0						
DACTM	270365.9	60	114589.5	25	69540.8	15	454496.2	45449620	22725	2.66	100

To Convert From	To	Multiply By
Pounds (1b) Tons (ton)	Kilograms (kg) Kilograms (kg) Metric Tons	0.453 907.2 0.907

Table 3-2
LIVESTOCK MANURE IN GREAT LAKES BASIN BY AREA AND SUBAREA

## Total Tonnage and Percent of Total By Kind of Livestock

	Subarea	cattle tons	2	Horses		Chicker	ns	Swine	2	Sheep		<u>Tu≇ke</u> tons	ys	Total tons of
	Area	manure	<u>%</u>	manure	<u>%</u>	manure	<u>%</u>	manure	<u>%</u>	manure	<u>%</u>	manure	<u>%</u>	manure
	1.1	731205	87	83211	10	9904	1	4700	1	4509	1	503	0	834031
	1.2	299130	85	44768	13	2983	1	1764	0	4245	1	0	0	352890
	1.0	1030335	87	127979	11	12887	1	6464	0	8754	1	503	0	1186921
	2.1	9571400	93	143762	1	61470	1	518536	5	24118	0	3750	0	10323056
	2.2	4127793	76	730518	13	109267	2	425978	8	37568	1	2570	0	5433964
	.23	7319800	69	1552233	14	197756	2	1244456	12	222789	2	132180	1	10669214
	2.4	1797969	83	284496	13	31746	1	41572	2	18490	1	6307	0	2180580
	2.0	22816962	80	2711009	9	400239	1	2230542	8	302965	1	144807	1	28606524
39	3.1	789999	85	101486	11	6323	1	15291	2	10465	1	00	0	923564
	3.2	2812566	82	413101	12	65025	2	121681	3	35581	1	00	0	3447954
											1			
	3.0	3602565	82	514587	12	71348	2	136972	3	46046	Т	00	0	4371518
	4.1	2583516	72	715630	20	37987	1	145323	4	113344	3	00	0	3595530
	4.2	3956796	63	526447	8	268180	4	1161675	19	265830	4	134360	2	6313288
	4.3	1278460	76	326503	19	30638	2	30262	2	14651	1	7542	0	1688056
	4.4	2195089	85	331283	13	28280	1	16108	1	15332	0	3928	0	2590020
	4.0	10013861	71	1899593	13	365085	3	1353368	9	409157	3	144420	1	
	5.1	1877209	84	266195	12	27498	1	21704	1	48617	2	503	0	2241728
	5.2	3930238	86	460834	10	93364	2	31581	1	46109	1	4468	0	4566594
	5.3	2420802	93	148695	6	9818	1	4584	0	2571	0	3142	0	2589612
	5.0	8228249	88	875724	9	130680	2	57869	1	97299	1	8113	0	9397934
	BASIN	45691972	79	6128892	10	980239	2	3785215	6	864221	2	297842	1	57748381

To Convert From To Multiply By
Tons (ton) Kilograms (kg) 907.2
Metric Tons 0.907

Table 3-3

Subarea	Harvested	Harvested Tons of cropland livestock	Tons manure per harvested	Manure pro-	Tons of	Tons of primary nutrients in manure			Primary nutrients per harvest	Manure primary nutrients
Area	acres	manure	cropland acre	index	(N)	(P <sub>2</sub> 0 <sub>5</sub> )	(K <sub>2</sub> 0)	<u>in manure</u>	crop. acre	index
1.1	175073	834031	4.76	141	4916	872	4255	10043	115	140
1.2	88955	352890	3.97	118	2097	370	1822	4289	96	117
1.0	264028	1186921	4.50	134	7013	1242	6077	14332	109	133
2.1	2226946	10323056	4.64	138	58541	10753	51159	120453	108	132
2.2	2009410	5433694	2.70	80	32560	5981	27409	65950	66	80
2.3		10669214	3.77	112	66190	12402	54020	132612	94	115
2.4	493782	2180580	4.42	131	13092	2331	11173	26596	108	132
2.0	7560723	28606524	3.78	112	170383	31467	143762	345612	91	111
3.1	195595	923564	4.72	140	5441	959	4745	11145	114	139
3.2	1469446	3447954	2.35	70	20722	3734	17583	42039	57	70
3.0	1665041	4371518	2.63	78	26168	4692	22331	53191	64	78
4.1	1068323	3595530	3.37	100	22308	3893	19028	45229	85	104
4.2	3802981	6313288	1.66	49	41708	8332	31419	81459	43	52
4.3	312904	1688056	5.39	160	10364	1830	8746	20940	134	163
4.4	473598	2590020	5.47	162	15377	2711	13290	31378	133	162
4.0	5657806	14185484	2.51	74	89735	16729	72480	178944	63	77
5.1	567936	2241728	3.95	117	13576	2387	11649	27612	97	118
5.2	990426	4566594	4.61	137	27519	4923	23340	55782	113	138
5.3	411461	2589612	6.29	187	14843	2633	13084	30560	149	182
5.0	1969823	9397934	4.77	142	55937	9944	48073	113954	116	141
BASIN	17117421	57748381	3.37	100	349236	64074	292723	706033	82	100

 To Convert From
 To
 Multiply By

 Pounds (1b)
 Kilograms (kg)
 0.453

 Tons (ton)
 Kilograms (kg)
 907.2

 Metric Tons
 0.907

Table 3-4
COMMERCIAL FERTILIZER USED, INTENSITY OF USE AND NUTRIENT INTENSITY

	area Comm.		Lbs. comm. fert. per	comm.	. Primar	- Barrier - Contract -	the same of the sa	-	ercial fert		Tons primary	Lbs Primary nutri. per	Primary nutrient
and Area		, Percent liquid	harvest acre	fert.	tons	(N) <u>%</u>	(P <sub>2</sub> O <sub>5</sub> )	%	tons (K20	<del>20)</del>	nutrients total	harvest crop	index per harvest acre
			Total Volation				11 10		RECEIPT OF				
1.1			146	45	2734	39	2036	29	2289	32	7068	81	53
1.2	4040		91	28	652	33	633	32	695	35	1980	45	29
1.0		22	128	40	3386	37	2669	30	2993	33	9048	69	45
2.1	234908	19	211	66	31936	26	34278	28	55741	46	121955	110	72
2.2	348908	37	347	108	60938	36	45217	27	61903	37	168058	167	109
2.3	487799	24	345	107	75312	33	73002	32	79295	35	227609	161	105
2.4	75771	16	307	96	12252	33	11880	32	12996	35	37128	150	98
2.0	1147386		304	95	180438	32	164377	30	209935	38	554750	147	96
→ 3.1	20784	16	213	66	3327	33	3226	32	3530	35	10083	103	67
£ 3.1 3.2			398		47293		45861	32	50159	35	143313	195	
3.2				124		33			53689	35	153396		127
3.0	313237	10	376	117	50620	33	49087	32	33009	33	133390	184	120
4.1	197618	16	370	115	31956	33	30986	32	33891	35	96833	181	118
4.2	651276	28	343	107	103808	31	105889	32	122129	37	331826	175	114
4.3	42726	2	273	85	5925	28	7047	34	7980	38	20952	134	88
4.4	71332	8	301	94	8401		10102	37	8950	32	27453	116	76
4.0	962952	23	340	106	150090	32	154024	32	172950	36	477064	169	110
5.1	108277	7	381	119	13092	31	15624	37	13512	32	42228	149	97
5.2	168436	7	340	106	20366	31	24304	37	21020	32	65690	133	87
5.3	27360	7	133	41	3308	31	3948	37	3414	32	10670	52	34
5.0	304073	7	309	96	36766	31	43876	37	37946	32	118588	120	78
BASI	IN 2744528	22	321	100	421300	32	414033	32	477513	36	1312876	153	100

To Convert From	To	Multiply By
Pounds (1b)	Kilograms (kg)	0.453
Tons (ton)	Kilograms (kg)	907.2
	Metric Tons	0.907

# Total, Per Harvested Acre and Index of Use

Subarea and Area		Per harveste	THE PROPERTY OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN T			
		Tel narveste	d crop acre		Per acre tota	
	Total tons	Pounds	Index	Total tons	Pounds	Index
	2/260	278	164	20266	4.7	11
1.1	24369	174	102	46183	15.1	36
1.2	7737 32106	243	143	66449	9.0	22
1.0	32100	243				
2.1	81475	73	43	86379	16.5	40
2.2	230117	229	135	319912	122	292
2.3	321666	227	134	189667	42.1	101
2.4	59474	241	142	64813	15.9	38
2.4	692732	183	108	660771	41	98
10 10 10		12 223 25	20	34294	18.6	45
3.1	6281	64	38		32.2	77
3.2	22290	30	18	71909	26.1	63
3.0	28571	34	20	106203	20.1	
4.1	48932	92	54	175619	87.9	211
4.2	306809	161	95	115170	36.4	87
4.2	75890	485	285	136046	117.5	282
4.4	78788	333	196	116582	75.9	184
4.4	510419	180	106	543417	69.1	166
4.0	320122					
5.1	66825	235	138	185592	150.4	360
5.2	93608	189	111	123561	43.3	109
5.3	34740	169	99	29863	17.4	42
5.0	195173	198	116	339016	59.7	143
BASIN	1459001	170	100	1715856	41.7	100

To

Kilograms (kg)

Kilograms (kg)

Metric Tons

To Convert From

Pounds (1b)

Multiply By

0.453

907.2

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42

ENT

onnage 1459001

	Herbi	cides	Insect	icides	Fungicides		
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used	Acres	Amount Used	
Corn	5549139	152595.9	1233143	18494.1			
Grains	1735454		578483	5778.9			
Hay or Grass Silage	1386610	13855.9	1155508	11550.8			
Pastured Cropland	747433	7465.1	747433	7465.1			
Other Field Crops	3071486			10771.9	76487	11372.0	
Vegetables	402424	12427.9	374291	19644.9	377032	15053.1	
Orchards						-	
Berries	205662	9518.2	240955	40883.8	246916	43115.	
Nursery, Greenhouse Other Crops							
	2001		- 4				
Totals	13098208	270365.9	4588893	114580.5	700335	69540.8	

TABET.	O MANTENDE	****	ALTERNATION.
LABLE	2MANURE	FROM	SWINE

0.907

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	2490075	263418	249929	513347
1969	2409844	225020	225884	450904
1972	2553059	255152	258958	514110

Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons 3785970 19037 Phosphorus, tons Potash, tons 14376

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964 1969 1972	5359820 4558551 4815647	2529837 2098534 2206015	2829983 2460017 2609632			
Wet Manure Per Anim		13.14	6.45			
Wet Manure Tons, 19		28987031	16832126			
Wet Manure Nutrients :		Combined: 4 n, tons rus, tons	5819157 257381 45960			

## TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	783829	
1969	642952	139966
1972	536783	479569
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	864221	6128892
Nutrients in Wet Manure: Nitrogen, Tons	12099	42289
Phosphorus, Tons	1815	6122
Potash, Tons	8642	36731

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	23633646		
1969	24013642		
1972	23648717	480590	4739460
Wet Manure Factor: Lbs. per bird	82.9	365	89.63
Wet Manure Defecated: Tons, 1972	980239	3-7	-7.00
Nutrients in Wet Manure: Nitrogen, tons	15292	Combined	298910 4659
Phosphorus, tons	3921		1195
Potash, tons	3431		1045

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

Number of farms Acres in farms 33 Cropland in farms 24	ber of farms 207598 ber in farms 33308065 pland in farms 24296393			farms 27 farms 20 pland	133272 449678 945202
	Crop	P	Tons o	f Fertilize	r Used
Crops	Acre	as	Dry	Liquid	Total
CORN	475236	7	672758	187349	860107
GRAINS	286384	2	294919	12095	307014
Wheat	116868	2	152215	8689	160904
Oats	155970	8	131093	3120	134213
Barley	4973	7	5183	153	5336
Rye	4650		3301	77	3378
OTHER FIELD CROPS	3258469	9	258338	18823	277161
Soybeans	234699	1	82587	7831	90418
Potatoes	9613	3	53198	3015	56213
Sugar beets					
Field beans	9913	5	597	34	631
HAY OR GRASS SILAGE	389519		74524	1922	76466
PASTURED CROPLAND	2671806	5	25640	883	26523
Cropland used for pasture	2351337		21013	744	21757
Improved pasture	320469		4627	139	4766
VEGETABLES, SWEET CORN, MELONS	436589		102630	8081	110711
ORCHARDS	311552		47336	2459	49795
REDDIEC	18501		1,112	07	1/201

436589 311552 18591

39762 14650

47336 4113

12338

1494251

BERRIES NURSERY & GREENHOUSE PRODUCTS

Total Fertilizer Used, Tons Percant of Fertilizer Used

TABLE 7FERTILIZER U	ISED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALE
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	2145048	Year	Government Cost/Shared	Government Cost/Shared	To
Liquid	599486 2744528	1972			1
Primary Nutrients in Fertilizer	1312879	Ton	nages for Oth	er Recent Yea	rs
Vitrogen	421300				_
Phosphorus	414034				
Potash	477514				

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	1183019	
Total Est As Com	imated Tons Applied on All Hi puted 1715856	ghways in 1972-73,

# TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicio 270365.9		Insec 114589			ngicides 0.8	Total 454496.2
Manure: Ki	nd of		Tons o	f Material	s in We	et Manure I	efecated
Livestoc	k	M	anure	Nitroge	in l	Phosphorus	Potash
Swine: Tab	1e 2	37859	70	19037		5324	14376
Cattle: Ta	ble 3	458191		257381		45960	229804
Sheep: Tab	le 4	8642	21	12099		1815	8642
Horses: Ta	ble 4	61288	92	42289		6122	36731
Chickens:	Table 5	9802	39	15292		3921	3431
Turkeys: I	able 5	2989	298910 4659			1195	
Total from Ton		578773	89	350757		64337	294029
Fertilizers	:	Ton	s of Co	mmercial F	ertilia	zers Applie	đ
			1			utrients	
Ite	m	Tot	al	Nitrogen	Pi	nosphorus	Potash
Applied on Table 7	Cropland:	27445	28	421300	:4	414034	477511
Lime: Lime Tabl	stone equiv	alent p 459001	urchase	d or appli	ed, tor	18:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

#### 3.1.2.3 Commercial Fertilizers

For many years it was common to recommend using more fertilizer for better agricultural production. Farmers responded accordingly and have been using more fertilizer. At the same time the amount of primary nutrients in fertilizer, namely: nitrogen, phosphorus and potash--have been increasing. In 1955 nutrients represented 33 percent of fertilizer composition; in 1970 they were 46 percent. These actions produced large amounts of nutrients that have been applied to croplands in the Basin. A total of 2,489,836 metric tons (2,744,528 tons) of commercial fertilizers were applied to crops in the Great Lakes Basin in 1972. This includes 1,191,041 metric tons (1,312,879 tons) of primary nutrients. The average amount of commercial fertilizer per harvested acre is 145 kilograms (321 lbs), and primary nutrients averaged 69 kilograms (153 lbs) per harvested acre. The lake basin with the highest average was Lake Huron. Lake Erie was second, followed closely by Lakes Michigan and Ontario. Lake Superior basin uses the least amount of commercial fertilizers, averaging only 40 percent of the index for fertilizer and 69 percent of the average nutrient amount.

#### 3.1.2.4 Lime

Lime as applied to croplands is important in terms of its water quality impacts due to its effects on the pH level of water and subsequent effects on the waters' acid-base relationships. The possibility of precipitating phosphorous in the water and altering calcium content is also likely.

A total of 1,323,606 metric tons (1,459,001 tons) of limestone was used in the Great Lakes Basin in 1972. The average amount of lime used per harvested acre was 170 pounds for the Basin (31 kilograms/harvested hectare). Lake Superior basin used the greatest amount 44.5 kilograms/harvested hectare (243 lbs/harvested acre), with Lake Ontario being second. Lake Michigan and Erie basins followed closely with Lake Huron basin using the least amount of lime on croplands 6.2 kilograms/harvested hectare (34 lbs/harvested acre).

### 3.1.2.5 Salts

Due to climatic conditions in the Basin, road deicing salts are required to keep major roadways clear during the winter. However, the use of salts may have an impact upon ground and surface water areas. Assuming that chlorides are conservative and that ion exchange between chlorides and various soil types are minimal, most of the chlorides will eventually reach ground and surface water areas. Alternative substances have been sought, but none have proven economically feasible. Methods of conserving the amounts used are also being implemented.

The 1972-73 application of road salts totaled 1,556,625 metric tons (1,715,856 tons) that were used. The lake basin using the greatest amount was Lake Erie which used more than one and a half times the Basin average [31.3 kilograms (69.1 lbs) per acre of total land area]. Lake Ontario basin was second followed closely by the Lake Michigan, Huron and Superior basins.

## 3.2 Trends and Projections

## 3.2.1 Agricultural Chemicals

It is projected that total amounts of insecticide used may be no larger in 10 years than now. Insecticide use may even decrease as much as 5 to 50 percent in this time period. However, a leveling out is more likely to occur. The use of fungicides will likely increase 10 to 15 percent in the next 10 years. Herbicides are projected to increase the most, approximately 20 to 25 percent. Combined this represents a projected overall increase in chemical tonnage of 12 to 18 percent in the next 10 years for the entire Great Lakes Basin.

Future use of agricultural chemicals will also be affected by new research and technology. There will be developments that provide more combination herbicide treatments—an application or two of a combined chemical serving several purposes. Biological methods or the development of insect populations to counter undesirable insects have not had much effect to date and probably will not have much more success in the next 10 years.

### 3.2.2 Animal Wastes

It is projected that manure production from cattle will increase 5 percent in the next 10 years. Beef-cows will be replacing dairy cows and more young cattle will be retained to be fed out. Horse numbers will be increasing 50 percent and swine numbers 20 percent, increasing manure production proportionately. Turkey increases will not affect manure production nor will sheep decreases, so far as the entire Basin is concerned. It thus appears that total manure production from livestock should be projected to increase 5 to 10 percent in the next 10 years. More significant than the total increase in amounts will be the concentration of livestock production—a big decrease in the number of farm units but a big increase in the amount of livestock kept per unit.

## 3.2.3 Commercial Fertilizers

Authorities differ as to what would represent reasonable future estimates for commercial fertilizers. Most projections fall within these ranges: phosphorus 0 to 15 percent increase in the next 10 years, potash 10 to 25 percent increase and nitrogen 20 to 35 percent increase. If these percentage figures are applied to the present total amount for nutrients of 1,191,154 metric tons (1,313,000 tons) it would give a range of from 1,313,626 to 1,489,622 metric tons (1,448,000 to 1,642,000 tons) in another 10 years. This represents an overall increase at the rate of about one percent a year.

## 3.2.4 Lime

Most soil scientists feel that the amount of lime applied from year to year will vary. They project that the annual amount 10 years from now may be about the same as at present.

### 3.2.5 Salts

In recent years the trend has been to increase the amount of salts used. This is in part due to the fact that the public has looked with favor on what is termed the "bare pavement policy." However, the cost of salt has been increasing substantially and the budgets for road deicing have tended to remain about the same.

Therefore, it is projected that the amount of salts applied will most likely remain at approximately present rates over the next 10 years. It is felt that some tonnage increases will probably occur, but will be only in proportion to the increase in road mileage.

### Section 4

## MATERIALS USAGE IN THE LAKE SUPERIOR BASIN

#### 4.1 Basin Characteristics

The Lake Superior basin is comprised of seventeen counties; four in Minnesota, four in Wisconsin and nine in Michigan. Complete census information for Cook County, Minnesota and Keweenaw County, Michigan was not available. The other 15 counties have a total land area of 5,996,700 hectares (14,806,592 acres) with about 90 percent in forests, 3 percent in urban areas, about 6 percent (365,300 hectares or 902,034 acres) in farms, in cropland and pasture, and the remainder in other land. The area is generally better known for its recreation, tourism, fishing, and forestry than for its agricultural activites.

## 4.1.1 Agricultural Characteristics

Soil and climate conditions limit agricultural activities. Most of the cropland is used for hay and pasture. Corn, where grown, is usually for silage and is raised primarily along the southern edges of the western counties. Oats is the major grain crop with the greatest acreage in Chippewa County, Michigan. The major potato county is Houghton in Michigan. Dairy cattle, and to a lesser extent beef cows, dominate the livestock production throughout the area. The most important agricultural products are potatoes, clover seed and dairy products, although such fruits as apples, blueberries, cranberries, and strawberries are grown along the southern shores of Lake Superior.

No major increases in crop production or livestock numbers are expected in the next 10 years. Agricultural opportunities will continue. The economic outlook, together with climatic factors, distances to markets, and population declines will not result in much, if any, expansion. The greatest likelihood for livestock is that they will decrease in number during the next decade.

Table 4-1 indicates the relative proportions of materials usage in the Lake Superior basin as compared to the total U.S. Great Lakes Basin.

Table 4-1
MATERIALS USAGE BASIN RELATIONSHIP--LAKE SUPERIOR 1.0 TO GREAT LAKES

Per harvested acre of cropland	Lake Superior basin	Great Lakes Basin
Lbs of chemicals applied Index of chemicals used	1.18	2.66
Tons of livestock manure defecated Index of manure defecated	4.50 134	3.37 100
Lbs primary nutrients in livestock ma Index of primary nutrients in manure	nure 109 133	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	128 22 40	321 22 100
Lbs primary nutrients in commercial f Index primary nutrients in commercial		153 100
Lbs of lime applied Index of lime applied	243 143	170 100
Per acre of total land area Lbs road salts used Index road salts used	8.98 22	41.74 100
Pounds (1b) Kilog	rams (kg) rams (kg) c Ton	Multiply By 0.454 907.2 0.907

## 4.1.2 Materials Usage

An inventory and analysis on materials usage was made based on personal interviews, correspondence and statistics as available from agricultural statistics, census information, state highway departments, universities, private companies, and state and federal agencies. Background for the analysis is presented in the Methodology Section. Table 4-2 summarizes the findings of this inventory and analysis. Detailed statistics are shown in Table 4-3.

Table 4-2

MATERIALS USAGE
(in 1972)

discrete design	Chemicals Applied Livestock to Crops Manure	Commercial Fertilizer on Cropland	Limestone Purchased	Salts Applied to all Highways
Area	(100 lbs) (tons)	(tons)	(tons)	(tons)
Lake Superior basin	3,108 1,186,918	3 16,860	32,106	66,449
PSA 1.1	2,073 834,028	3 12,820	24,369	20,266
PSA 1.2	1,035 352,890	4,040	7,737	46,183
To Convert From	Ţ	0	M	Multiply By
Pounds (1b)	Kilog	rams (kg)		0.454
Tons (ton)	Kilog	rams (kg)		907.2
	Metri	c Ton		0.907

## 4.1.2.1 Agricultural Chemicals

There was a total of 141,000 kilograms (310,840 pounds) of agricultural chemicals spread on agricultural lands in the Lake Superior basin in 1972. Herbicides accounted for 44 percent, insecticides 44 percent, and fungicides 12 percent of the chemicals used. This amounts to 0.54 kilograms (1.18 pounds) of chemicals applied per acre of harvested cropland. Harvested cropland acres represented about 29 percent of all land in farms. Had the total chemical usage been equated in terms of all farmland, 365,000 hectares (902,034 acres), the rate would have been 0.15 kilograms (0.34 pounds) of chemicals applied per acre. Had it been equated in terms of the total land area, it would have amounted to only 0.004 kilograms per hectare (0.02 pounds per acre).

Herbicide usage is expected to increase about 10 percent and fungicide usage about 5 percent in the next ten years. Most chemical authorities expect that insecticide usage may not be any greater and perhaps even decrease in the next 10 years. However, insecticide usage is expected to increase in the next five years, but to decrease progressively after that.

One of the problems concerning the use of chemicals, even if effective in performing their functional roles is that some residues will remain in the soils. In the case of herbicides, this is known as "carryover" and in the case of insecticides as "persistence". It is believed that the persistence associated with insecticides will be almost entirely eliminated in the future and that carryover in herbicides will be greatly reduced, if not also eliminated.

## 4.1.2.2 Animal Wastes

It is calculated that 1,076,800 metric tons (1,186,922 tons) of wet manure are produced annually in the Lake Superior basin. Of this amount, 87 percent is produced from cattle, 11 percent from horses and the remaining 2 percent from other types of livestock. Nitrogen, phosphorous and potash combined comprise 1.2 percent of the total manure defecated.

## 4.1.2.3 Commercial Fertilizers

A total of 15,295 metric tons (16,860 tons) of commercial fertilizers were applied to crops in the Lake Superior basin in 1972. Primary nutrients of nitrogen, phosphorus and potash comprise 8,208 metric tons (9,048 tons), or 54 percent of the tonnage. Nitrogen accounts for 37 percent, phosphorous 30 percent and potash 33 percent of the primary nutrient content by weight.

Commercial fertilizer use may continue at about present levels. Farming will tend to be concentrated on fewer, but larger farms. Commercial fertilizer use on these larger farms will increase, as will the percent applied in liquid form. However, overall rates of application per acre of total farmland and especially per unit of total land area will not increase.

### 4.1.2.4 Lime

A total of 29,130 metric tons (32,106 tons) of limestone was used in the Lake Superior basin in 1972. Lime is important in terms of its water quality impacts due to its effects on the pH level of water

and subsequent effects on water's acid - base relationships. The possibility of precipitating phosphorous in the water and altering the calcium content is also likely.

The usage of lime in agricultural operations is not likely to increase in the future. This is partly predicated on the expectation that the Federal government will not increase its lime cost-sharing agreements with farmers. Even if the cost-sharing agreements increase, it is not expected to significantly affect lime usage rates.

## 4.1.2.5 Salts

Because of severe climatic conditions during winter and the resultant heavy snowfalls, road de-icing salts are required to keep major roadways open. The mileage of major highways for this area is modest relative to the total land area, explaining the low de-icer index. It is calculated that 60,280 metric tons (66,449 tons) were applied to highways in the Lake Superior basin in the 1972-73 winter. The primary impact upon ground and surface waters resulting from road de-icing salts comes from chloride discharges which can, over time, affect the salinity of nearby wells and open water areas. The 1972-73 application would produce 44,725 metric tons (49,300 tons) of chlorides. Assuming that chlorides are conservative and that ion exchange between chlorides and various soil types are minimal, most of the chlorides will eventually reach ground and surface water areas.

Road de-icing salt usage will increase in approximate proportion to road mileage increases. The so-called bare-pavement policy will likely continue to be demanded by the public for the major highways. This may be offset by slightly lower or less frequent applications on lesser traveled highways.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds Minnesota, Wisconsin, STATE: Michigan

PLANNING AREA: Lake Superior 1.0

PLANNING SUBAREA: West 1.1, East 1.2

Cropland in farms
Harvested cropland in farms

Number of farms
Acres in farms

COUNTY: 17 County Totals (Minnesota-4, Wisconsin-4, Michigan-9) (1) TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969 14806592 Number I-V farms 2265 4150 Acres in I-V farms 632621 902034 Cropland I-V farms 323572 439044 Harvested cropland 264028

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	2025	55.4	450	6.7		
Grains	19589	96.9	6529	64.3		
Hay or Grass Silage	78624	785.1	65520	655.5		3.5
Pastured Cropland	33575	333.2	33575	333.2		
Other Field Crops	1868	54.1	1992	228.0	1987	297.0
Vegetables	296	6.2	296	21.8	296	3.9
Orchards						
Berries	426	24.5	488	47.1	497	95.5
Nursery, Greenhouse						
Other Crops						
Totals	136403	1355.4	108850	1356.6	2780	396.4
Total Herbicides, In	secticide	s. Fungic	ides: 10	0 1bs	248033	3108.4

TABLE	2-	MAN	URE	FROM	SWINE	

	Hog & Pig		Number Sows Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	5017	391	318	709
1969	3941	396	292	688
1972	5363	486	408	894

Potash, tons\_

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	143846	69191	74655		
1969	95268	47169	48099		
1972	1.08400	49500	58900		
Wet Manure Per Anima	actor: Tons	13.14	6.45		
Wet Manure 1	The state of the s	650430	379905		
	Defecated: Tons, 1972	The Part of the Control of the Contr	1030335		
Nutrients in		en, tons	5770		
		orus, tons	5152		

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	9155	
1969	6701	2635
1972	5437	1.0014
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	8754	127979
Nutrients in Wet Manure: Nitrogen, Tons	123	883
Phosphorus, Tons	123 18	128
Potash, Tons	87	768

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey	Turkeys
1964	244362		
1969	165695		
1972	310900	800	8000
Wet Manure Factor: Lbs. per bird	82.9	365.0	89.63
Wet Manure Defecated: Tons, 1972	12887		
Nutrients in Wet Manure: Nitrogen, tons	201	Combined	503
Phosphorus, tons	52		2
Potash, tons	45		2

	Crop	1		
Crops	Acres	I		
The state of the s	7.00	- 0		

COUNTY, land area, acres (2) 14806592

	Crop	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	Total
CORN	1974	244	1	245
GRAINS	29687	2801	17	2818
Wheat	606	38	1	39
Oats	27116	2554	16	2570
Barley	736	77		77
Rve	308	33		33
OTHER FIELD CROPS	2278	1159		1159
Soybeans	100	4600		
Potatoes	2095	1076	E	1076
Sugar beets				
Field beans	1993	78	1	79
HAY OR GRASS SILAGE	178035	1227	3	1230
PASTURED CROPLAND	103677	704		704
Cropland used for pasture	93895	611		611
Improved pasture	9782	93		93
VEGETABLES, SWEET CORN, MELONS	315	76		76
ORCHARDS	533	74	2	76
BERRIES	259	47	1	48
NURSERY & GREENHOUSE PRODUCTS	169	50	1	51
OTHER CROPS	47			
Total Fertilizer Used, Tons		6460	26	6486
Percent of Fertilizer Used		99	1	100

			APPLIED				
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	13178	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	3782	1972			32106		
Total	16860	Tonnages for Other Recen		or Recent Ves			
Primary Nutrients in Fertilizer	9048	101	mages for our	er Necesse rea			
Nitrogen	3386				-		
Phosphorus	2669						
Potash	2993						

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72	The state of the s	
1972-73	45814	
	timated Tons Applied on All Hi mputed 66449	ghways in 1972-73,

Table 1	Herbicide		ecticides 6.6	Fungicides 396.4	Total 3108.4
CONTRACT CON	1355.4		The second second		
Manure: K				s in Wet Manure I	
Livesto		Manure		n Phosphorus	
Swine: Tal		6464	32	9	25
Cattle: Ta	able 3	1030335	5770		5152
Sheep: Tal	ole 4	8754	123	18	87
Horses: T.	able 4	127979	883	128	768
Chickens: Table 5		12887	201	52	45
Turkeys: Table 5		503	8	2	2
	Livestock,	1186922	7017	1239	6079
Fertilizer	3:	Tons of	Commercial F	Fertilizers Applie	ed .
				mary Nutrients	
Ite	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	16860	3386	2669	2993
	estone equiv		sed or appli	led, tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047

- (1) Total are for 15 counties as information Cook county, Minnesota and Keweenaw coun-county, Michigan are not available.
- (2) County, land area, acres includes water areas under 40 acres in size. 51

## 4.2 Planning Subarea 1.1

Eight counties, four in Minnesota; Carlton, Cook, Lake, St. Louis, and four in Wisconsin; Ashland, Bayfield, Douglas, Iron, comprise the planning subarea. Census information for Cook County is not available. The other counties have a total land area of 3,513,600 hectares (8,682,000 acres). Farm land equals 246,420 hectares (608,900 acres) or 7 percent of the total land area. National forests and recreation areas are the predominant land use in this area. Although PSA 1.1 has a relatively limited agricultural base, it is the major agricultural region in the Lake Superior basin.

## 4.2.1 Agricultural Characteristics

From an agricultural viewpoint, the eight counties are quite similar. Practically all of the cropland is used for hay and pasture. Ashland, Bayfield and Carlton are the only counties growing 160 hectares (400 acres) or more of corn, and along with St. Louis County, are the only counties with more than 600 hectares (1,500 acres) used for grain production.

Table 4-4 indicates the relative proportions of materials usage in the planning subarea as compared to the total U.S. Great Lakes Basin.

Table 4-4

MATERIALS USAGE BASIN RELATIONSHIP -- PSA 1.1 TO GREAT LAKES

Per harvested acre of cropland	Planning Subare	a 1.1	Great Lakes Basin
Lbs of chemicals applied Index of chemicals used	1	.18 44	2.66
Tons of livestock manure defecated Index of manure defecated		141	3.37 100
Lbs primary nutrients in livestock Index of primary nutrients in manure		115 140	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied		146 24 45	321 22 100
Lbs primary nutrients in commercial Index primary nutrients in commercial		82 54	153 100
Lbs of lime applied Index of lime used		278 164	170 100
Per acre of total land area			
Lbs road salts used Index road salts used		4.67	41.74
Tons (ton) Ki	To lograms (kg) lograms (kg) tric Tons		Multiply By 0.454 907.2 0.907

## 4.2.2 Materials Usage

The following table summarizes by county the material usage inventory for PSA 1.1. Detailed statistics are shown in Tables 4-6 to 4-14.

Table 4-5 MATERIALS USAGE (in 1972)

PSA 1.1	Chemicals Applied to Crops (100 lbs)	Manure	Commercial Fertilizer on Cropland (tons)	Limestone Purchased or Applied _(tons)	6.4
Minnesota					
Ashland	211	100,305	657	2,745	2,901
Bayfield	453	138,551	870	4,237	2,972
Carlton	480	231,853	4,384	6,739	754
Cook	9	1,314		85	5,179
Wisconsin					
Douglas	220	99,872	731	2,825	3,426
Iron	123	21,634	554	820	3,060
Lake	20	9,521	71	299	157
St. Louis	557	230,978	5,553	6,619	1,817
TOTAL	2,073	834,028	12,820	24,369	20,266
To Convert 1	From		То		Multiply By
Pounds (1b)	)	Kilo	grams (kg)		0.454
Tons (ton)		Kilo	grams (kg)		907.2
		Metr	ic Tons		0.907

## 4.2.2.1 Agricultural Chemicals

Agricultural chemicals used in PSA 1.1 accounted for 67 percent of the total amount of agricultural chemicals used on croplands in the Lake Superior basin. The major use was on crops of grains, hay or grass silage or on pastured cropland with only a small amount applied to vegetable and fruit crops.

There were 94,050 kilograms (207,340 pounds) of agricultural chemicals used in 1972. Herbicides represented 46 percent of the total, insecticides 43 percent and fungicides, 11 percent. It is expected that herbicide use may increase 10-25 percent in the next 10 years and fungicide use 5-10 percent. Insecticide use on grain and forage crops may increase 30-40 percent in the next 5 years and decrease to levels below present usage in 10 years.

#### 4.2.2.2 Animal Wastes

There were 34,000 head of cows and heifers calved and 44,100 head of other types of cattle in 1972. Cattle account for 87 percent of the livestock manure produced; horses, 10 percent; and chickens, swine, and sheep 1 percent each.

The total livestock manure produced in PSA 1.1 was 756,620 metric tons (834,028 tons). This represented 70 percent of the total manure produced in the Lake Superior basin.

Livestock numbers are not likely to change significantly in the next 10 years. There are no indicators suggesting any major shifts or upward changes. Manure production from livestock may continue at about present levels or show some decrease.

## 4.2.2.3 Commercial Fertilizers

Currently 11,630 metric tons (12,820 tons) of commercial fertilizers are applied to croplands in PSA 1.1 with primary nutrients representing 6,412 metric tons (7,068 tons) or 55 percent fo the total. Nitrogen comprises 39 percent, phosphorus 29 percent, and potash 32 percent of the primary nutrients by weight. Commercial fertilizer usage in PSA 1.1 accounted for 76 percent of the total amount of commercial fertilizers used in the Lake Superior basin.

Because crop production rates are not expected to change significantly in the next ten years, nitrogen fertilizer use may increase modestly with other fertilizer nutrient levels continuing at about present rates. The percent applied in liquid form may increase slightly.

## 4.2.2.4 Lime

There were 22,107 metric tons (24,369 tons) of lime purchased or applied in PSA 1.1. This accounts for 76 percent of the total limestone purchased or applied in the Lake Superior basin.

Liming amounts and rates are not likely to change much in spite of the tremendous increase in needs projected by the National Limestone Institute. Even government cost-sharing programs, if operating, will not change this greatly.

#### 4.2.2.5 Salts

There were 18,385 metric tons (20,266 tons) of road de-icing salt applied in PSA 1.1. This represented 30 percent of all road de-icing salts applied in the Lake Superior basin. The major amounts of salts were used in heavily urbanized areas, mainly around the Duluth-Superior portion of the Lake Superior basin. The amounts of road de-icing salts may increase in proportion to increases in road mileage. However, increasing salt costs will limit expanded usage.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Superior 1.0 STATE: Minnesota and Wisconsin

PLANNING SUBAREA: West 1.1 COUNTY: 8 County Totals (1)

BLE	1ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS.	1972	

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	2025	55.4	450	6.7		
Grains	11231	55.9	3743	37.3	-	
Hay or Grass Silage	57810	578.1	48175	481.5		
Pastured Cropland	21242	212.2	21242	212.2		
Other Field Crops	800 296	23.1	805	92.0	800	120.0
Vegetables	296	6.2	296	21.8	296	3.9
Orchards						
Berries	126	24.5	1488	47.1	497	95.5
Nursery, Greenhouse						
Other Crops						
Totals	02020	orr 1	arts on	909.6	7,000	070 1
Totals Total Herbicides, In	93830	955.li	75199	898.6	1593	219.1

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	3711	289	282	571	
1969	2803	280	1.65	1015	
1972	4240	372	278	650	

Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons 7.23 Phosphorus, tons Potash, tons 18

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	103927	16103	55824			
1969	67580	33011	34569			
1972	78100	34000	1413.00			
Wet Manure I Per Animal	Factor: Tons	13.74	6.45			
Wet Manure I Tons, 1972		1,146760	2814145			
Wet Manure I Nutrients in	Defecated: Tons, 1972 wet Manure: Nitroge Phospho	rus, tons 1:00h	5			

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	7120	
1969	31,80	1740
1972	31,80 2800	6511
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	4508	83210
Nutrients in Wet Manure: Nitrogen, Tons	63	574
Phosphorus, Tons	9	83
Potash, Tons	45	1499

### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	135924		
1969	101935		
1972	238900	800	8000
Wet Manure Factor: Lbs. per bird	82.9	365.0	89.63
Wet Manure Defecated: Tons, 1972	9902		
Nutrients in Wet Manure: Nitrogen, tons	154	Combined	503
Phosphorus, tons	40		2
Potash, tons	35		2

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (2)	8682018	Number I-V farms 1600
Number of farms	2911	Acres in I-V farms 429469
Acres in farms	608918	Cropland I-V farms 208663
Cropland in farms	279305	Harvested cropland
Harvested cropland in farms	175073	I-V farms 138062

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	11/46 16359	177	0	3.77
GRAINS	16359	177 1572	9	1581
Wheat	471	26	0	26
Oats	14972	11/1/17	9	1/150
Barley	384	46	0	146
Rye	112	14	0	)1
OTHER FIELD CROPS	1003	568	0	568
Soybeans	100	0	0	0
Potatoes	902	568	. 0	568
Sugar beets	0	0	0	0
Field beans	1208	2	0	2
HAY OR GRASS SILAGE	123827	910	. 3	913
PASTURED CROPLAND	67932	473	0	473
Cropland used for pasture	59489	396	0	396
Improved pasture	8443	77	0	77
VEGETABLES, SWEET CORN, MELONS	278	68	0	68
ORCHARDS	466	54	2	77 68 56
BERRIES	93	13	0	13
NURSERY & GREENHOUSE PRODUCTS	82	39	1	40
OTHER CROPS	lili	0	0	0
Total Fertilizer Used, Tons		3876	15	3891
Percent of Fertilizer Used		99	1	100

## TABLE 7-- FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

INDLE /FERTILIZER	DODD IN TALE	INDLE		TESTONE EQUIV	ALLEGE
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	9684	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	3136	1070			21,369
Total	12820	1972	f 011	D V	
Primary Nutrients in Fertilizer	7068	Ton	nages for Oth	er Recent Yea	rs
Nitrogen	2734				_
Phosphorus	2036				
Patrah	2208				

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	13973	
Total Estimat	ted Tons Applied on All Hi	ghways in 1972-73,

## TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Chemicals:	Hunar	edweight A	pplied on Cro	prand	
1	Herbicides	Inse	cticides	Fungicides	Total
Table 1 9	55.4	891	8.6	219.4	2073.4
Manure: Kind o	of [	Tons	of Materials	in Wet Manure De	efecated
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2	2	4700	23	7	18
Cattle: Table	3	731205	4094	731	3656
Sheep: Table 4		4508	63 574	9	45
Horses: Table	4	83210	574	83	499
Chickens: Tabl	Le 5	9902	154	140	35
Turkeys: Table	2 5	503	8	2	2
Total from Live Tons	estock,	834028	1916	872	4255
Fertilizers:		Tons of C		tilizers Applied	i
		A-71/21/2007		ry Nutrients	
Item		Total	Nitrogen	Phosphorus	Potasi
Applied on Crop	oland: 12	820	273h	2036	2298

Table 7 1 

Lime: Limestone equivalent purchased or applied, tons: Table 8

Salts: Applied on all highways, tons: Table 9 20266

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

- (1) The totals are for 7 counties as information for Cook county, Minnesota is not available.
- (2) County, land area, acres includes water under 40 acres in size. 55

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING	AREA:	Lake	Superior	1.0	STATE:	Minnesota
DI ANNITAC	CHRADRA.	West.	1.1		COTINETY.	Carlton

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	360	9.9	80	1.2		
Grains	1800	9.0	600	6.0		
Hay or Grass Silage	13830	138.3	11525	115.2		
Pastured Cropland	4811	48.1	4811	18.1		
Other Field Crops	350	9.7	305	34.6	300	45.0
Vegetables	137	2.8	137	10.3	137	1.7
Orchards			111200			A
Berries						
Nursery, Greenhouse					Trans.	
Other Crops						
Totals	21288	217.8	17158	215.4	h37	46.7

#### TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	501	65	53	118
1969	752	55	54	109
1972 (	1) 1380	99	101	200

1972 (1) 1300	99	101 200
Wet Manure Factor: Tons	per litter farrowe	ed 7.23
Wet Manure Defecated: Ton	s, 1972	11/16
Nutrients in Wet Manure:	Nitrogen, tons	7
	Phosphorus, tons	2
	Potash, tons	6

(1) Farrowing trends applied to obtain 1972 Inventory.

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	24820	11398	13422			
1969	17190	8333	8857			
1972	21/100	10500	10900			
Wet Manure Per Anima	Factor: Tons	13.14	6.45			
Wet Manure Tons, 197		137970	70305			
	Defecated: Tons, 1972 n Wet Manure: Nitroge Phospho Potash,	n, tons 1166 rus, tons 208	S			

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs ,	Horses & Ponies
1964	2483	
1969	1131	382
1972	700	1455
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1127	18595
Nutrients in Wet Manure: Nitrogen, Tons	16	128
Phosphorus, Tons	2	19
Potash, Tons	11	112

### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	15884		
1969	5637		
1972	46000	800	8000
Wet Manure Factor: Lbs. per bird Wet Manure Defecated: Tons, 1972	82.9	365.0	89.63
Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons	1907 30 8	Combined	503 8 2

## TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	557.71/1	Number I-V farms	398
Number of farms	705	Acres in I-V farms	101863
Acres in farms	139127	Cropland I-V farms	49270
Cropland in farms	63049	Harvested cropland	
Harvested cropland in farms	39980	I-V farms	32216

	Crop	Tons o	f Fertilizer	Used
Crops	Acres	Dry	Liquid	Tot
CORN	396	78	0	78
GRAINS	2905	235	0	235
Wheat	0	0	0	0
Oats	2814	221	0	221
Barley	66	12	. 0	12
Rye	25	2	0	12
OTHER FIELD CROPS	1412	224	0	22
Soybeans				VA. (2)
Potatoes	14145	22/4	0	22
Sugar beets				-
Field beans	30 28498	2	0	2
HAY OR GRASS SILAGE	28498	280	0	280
PASTURED CROPLAND	17510	113	0	111
Cropland used for pasture	14633	83	0	83
Improved pasture	2877	30	0	30
VEGETABLES, SWEET CORN, MELONS	128	lili	0	lile
ORCHARDS	0	0	0	0
BERRIES	0	0	0	0
NURSERY & GREENHOUSE PRODUCTS	2	1	0	1
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		977	0	977
Percent of Fertilizer Used		100	0	100

#### TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALEN

TABLE /FERFILIZER	USED IN 19	72 TABLE		MESTONE EQUIV	ALENI
Item	Tons		APPLIED	Tonnage not	
Fertilizer Used on Crops: Solid	32111	Year	Government Cost/Shared	Government Cost/Shared	Total
Liquid	1140	1972	6126	613	6739
Total	1,381				
Primary Nutrients in Fertilizer		Ton	nages for Uti	ner Recent Yes	TS
Nitrogen	1031			-	-
Phosphorus	712				
Potash	712				

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

dear	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	520	and the same of the same

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides		ticides	Fungicides	Total		
Table 1	217.8	21	2.4	46.7	179.9		
Manure: Kind of		Tons of Materials in Wet Manure Defecate					
Livestock		Manure	Nitrogen	Phosphorus	Pota		
Swine: Tab	le 2	1446	7	2	6		
Cattle: Tal	ole 3	208275	1166	208	10/1		
Sheep: Tab	Le 4	1127	16	2	11		
Horses: Tal	ole 4	18595	128	19	112		
Chickens: '	Table 5	1907	30	8	7		
Turkeys: Ta	able 5	503	8	2	2		
Total from 1		231853	1355	21/1	1179		

Tons	231053	1355	241	14/20
Fertilizers:	Tons of	Commercial Fer	tilizers Applied	
	(Fire - 1975)	Prima		
Item	Total	Nitrogen	Phosphorus	Pots
Applied on Cropland: Table 7	4384	1031	712	712

Lime: Limestone equivalent purchased or applied, tons: Table 8 6739

Salts: Applied on all highways, tons: Table 9 751

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds

PLANNI	NG AREA:	Lake	Superior	1.0	STATE:_	Minne	sota
PLANNI	NG SUBAREA:_	West	1.1		COUNTY:_	Cook	(Little information shown for Cook County.)

Crop Group or Crops	Herbicides		Insect	icides	Fungicides	
		Amount Used 100 lbs		Amount Used 100 lbs	Acres Treated	The second second second
Corn						
Grains						
Hay or Grass Silage	510	5.1	425	4.2		
Pastured Cropland		4				
Other Field Crops						
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	53.0	5.1	425	1.2		

otal mage 739

otal 2.9 ted otal 12 12 172

		ws Farrowing	
Year Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
	-		74

THE REAL PROPERTY.		Number Cattle and Calves				
Year Total	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964						
1969						
1972	100	100	*			
Wet Manure Per Anima	Factor: Tons	13.14				
Wet Manure Tons, 197		1314	-			
To a Street	Defecated: Tons, 1972	Combined: 1314				

TABLE 4MANURE FROM SHEEP AND HORSES		
Year Item	Sheep & Lambs	Horses & Ponies
1964		
1969		
1972		
Wet Manure Factor: Tons per animal	-	
Wet Manure Defecated: Tons, 1972		
Nutrients in Wet Manure: Nitrogen, Tons		
Phosphorus, Tons		
Potash, Tons		

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964				
1969				
1972				
Wet Manure Factor:	Lbs. per bird			
Wet Manure Defecate	d: Tons, 1972			
Nutrients in Wet Ma	nure: trogen, tons		Combined	-
	osphorus, tons		-	

COUNTY, land area, acres (1) Number of farms	Acre	per I-V fa	farms	
Acres in farms		pland I-V		
Cropland in farms	Harv	vested cro		
Harvested cropland in farms		I-V	farms	
	Crop	Tons o	of Fertilizer	Used
Crops	Acres	Dry	Liquid	Total
CORN				
GRAINS				
Wheat				
Oats				
Barley				
Rye				
OTHER FIELD CROPS				
Soybeans				
Potatoes				
Sugar beets				
Field beans				
HAY OR GRASS SILAGE				
PASTURED CROPLAND				
Cropland used for pasture				
Improved pasture				
VEGETABLES, SWEET CORN, MELONS				
ORCHARDS				
BERRIES				
NURSERY & GREENHOUSE PRODUCTS				-
OTHER CROPS				
Total Fertilizer Used, Tons				
Percent of Fertilizer Used				

		APPLIED					
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	-	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid		1972	22	g	85		
Total	-		Con Oak	9			
Primary Nutrients in Fertilizer	12	100	nages for Oth	er Recent Yea	rs		
Nitrogen	-						
Phosphorus							
Potash	-						

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	3571	

	Herbicides	Ine	ecticides	Fungicides	Total
Table 1	5.1	1110	4.2	O	9.3
Manure: Kind of		Tons	of Materials	in Wet Manure De	fecated
Livesto	k	Manure	Nitrogen	Phosphorus	Potash
Swine: Tab	le 2	-	-	-	-
Cattle: Ta	ble 3	1314	7	1	7
Sheep: Table 4			-	4	-
Horses: Table 4		+			-
Chickens: Table 5		-	-	-	-
Turkeys: 1	able 5	-	7	-	-
Total from Ton		1314	7	1	7
Fertilizers	it.	Tons of	Commercial Fer	rtilizers Applied	
				ary Nutrients	100 A 100 A
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	-		-	-

To Convert From
Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA:	Lake Superior 1.0	STATE:	Minnesota
DI ANNING SIBARRA+	West 1.1	COUNTY:	Take

TARLE	1ESTIMATED	AMOTINITS	OF	CHEMICATS	HISED	CAN	CDUDG	1077

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn						
Grains						
Hay or Grass Silage	810	8.1	675 263	6.7		
Pastured Cropland	263	2.6	263	2.6		
Other Field Crops						
Vegetables		The state of				
Orchards						-
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	1073	10.7	938	9.3		16000
Total Herbicides, In					2011	20.0

	TABLE	2MANURE	FROM	SWINE
--	-------	---------	------	-------

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	5	0	0	0
1969	20	1	0	1
1972	-		-	-
	ce Factor: To	ons per litter fa	arrowed -	
et Manui				
	re Defecated:	Tons, 1972		
let Manur	re Defecated:	Tons, 1972 re: Nitrogen, to		
let Manu	re Defecated:		ons =	

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	762	296	466			
1969	335	86	249			
1972	400	500	200			
Wet Manure I Per Animal	actor: Tons	13.14	6,45			
Wet Manure I		2628	1290			
	Defecated: Tons, 197					
Nutrients in	Wet Manure: Nitro					
		horus, tons 1				
		h, tons 20				

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	280	
1969	166	88
1972	100	88 335
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	161	1281
Nutrients in Wet Manure: Nitrogen, Tons	2	30
Phosphorus, Tons	0	4
Potash, Tons	2	26

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	1529		
1969	5993		
1972	28000		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	1161		
Nutrients in Wet Manure: Nitrogen, tons	18	Combined	
Phosphorus, tons Potash, tons	5		

## TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	1319808	Number I-V farms	13
Number of farms	145	Acres in I-V farms	2625
Acres in farms	6617	Cropland I-V farms	1263
Cropland in farms	2843	Harvested cropland	
Harvested cropland in f	arms 1577	I-V farms	636

	Crop	Tons o	f Fertilizer	Used
Crops	Acres	Dry	Liquid	Tota
CORN	0	0	0	0
GRAINS	0	0	0	0
Wheat				
Oats				
Barley				
Rye				
OTHER FIELD CROPS	0	0	0	0
Soybeans				
Potatoes				
Sugar beets				
Field beans				
HAY OR GRASS SILAGE	635	0	0	0
PASTURED CROPLAND	5147 5147	1	0	1
Cropland used for pasture	547	1	0	1
Improved pasture	0	0	0	0
VEGETABLES, SWEET CORN, MELONS				
ORCHARDS				
BERRIES	-		Frank III	
NURSERY & GREENHOUSE PRODUCTS				
OTHER CROPS				
Total Fertilizer Used, Tons		2	0	2
Percent of Fertilizer Used		2	0	100

## TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	53	Year	Government Cost/Shared	Government	Total Tonnage
Liquid	18	1972	272	27	299
Total	71			er Recent Yes	
Primary Nutrients in		100	mages for occ	ler Me Cent Ace	10
Fertilizer	40				
Nitrogen	16				
Phosphorus	12				
Potash	12				

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, 6 MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	108	
	ted Tons Applied on All Hi	phways in 1972-73.

## TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1 10.7		Insecticides 9.3		Fungicides	Total	
				-	20.0	
Manure: Kind	of	Tons	of Materials	in Wet Manure D	efecated	
Livestock		Manure	Nitrogen	Phosphorus	Potash	
Swine: Table	2	-	-	2	-	
Cattle: Table 3		3918	22	4	20	
Sheep: Table	neep: Table 4		5	0	2	
Horses: Tabl	e 4	4281	30	14	26	
Chickens: Ta	ble 5	11.61	18	5	4	
Turkeys: Tab	le 5	7	-		-	
Total from Livestock, Tons		9521	72	13	52	
Fertilizers:		Tons of C	ommercial Fer	tilizers Applie	d	
			Prima	ry Nutrients		
Item		Total	Nitrogen	Phosphorus	Potash	
Applied on Cr Table 7	opland:	71	16	12	12	

	101 111			_		_
Lime:	Limestone	equivalent	purchased	or	applied,	tons:
	Table 9	200				

Salts: Applied on all highways, tons: Table 9 157

To Convert From
Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
						The state of the s	No. No. William	seconds to mention

PLANNING AREA: Lake Superior 1.0 STATE: Minnesota

PLANNING SUBAREA: West 1.1 COUNTY: St. Louis

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	180	4.9	40	.6		
Grains	3660	18.3	1220	12.2		
Hay or Grass Silage	77/30	174.3	11,525	145.2		
Pastured Cropland	6396	63.9	6396	63.9		
Other Field Crops	180	5.4	200	23.0	200	30.0
Vegetables	138	2.9	138	10.4	138	1.7
Orchards						
Berries	0					
Nursery, Greenhouse						
Other Crops						
Totals	2798L	269.7	22519	200 3	338	31.7
Total Herbicides, In		s. Fungic	ides: 10	00 1bs	508/1	556.7

### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	2111	71/10	129	269
1969	1370	98	35	133
1972 (	1) 2055	148	52	200

The state of the s	100	N. V. V.
Wet Manure Factor: Tons	per litter farrowed	7.23
Wet Manure Defecated: Tor		11/1/6
Nutrients in Wet Manure:	Nitrogen, tons	7
	Phosphorus, tons	2
	Potash, tons	5

#### TABLE 3-MANURE FROM CATTLE

		Number Cattl	e and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	28328	12620	15708
1969	16319	7753	8566
1972	19200	9000	10200
Wet Manure F Per Animal	actor: Tons	13.14	6.45
Wet Manure Defecated: Tons, 1972		118260	65790
Wet Manure D Nutrients in		ogen, tons 10	BL050 331 3U
	Pota	sh, tons 97	20

## TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2095	
1969	2095	763
1972	1000	3021
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1610	38608
Nutrients in Wet Manure: Nitrogen, Tons	23	266
Phosphorus, Tons	3	39
Potash, Tons	16	232

## TABLE 5-MANURE FROM CHICKENS & TURKEYS

72623 61915		
61915		
127000		
82.9		
5264		
82	Combined	1 1990
21		
18		-
	127000 82.9 5264 82 21	127000 82.9 5264 82 21

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	3899072	Number I-V farms	401
Number of farms	915	Acres in I-V farms	107728
Acres in farms	181143	Cropland I-V farms	58088
Cropland in farms	87993	Harvested cropland	-
Harvested cropland in farms	56336	I-V farms	40395

	Crop	Tons o	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total		
CORN	82	7	0	7		
GRAINS	4804	1450	9	1459		
Wheat	104	7	0	7		
Oats	14172	384	9	393		
Barley	67	8	0	8		
Rye	1	0	0	0		
OTHER FIELD CROPS	238	69	0	69		
Soybeans	100	0	0	0		
Potatoes	100	69	0	69		
Sugar beets						
Field beans	87	0	0	0		
HAY OR GRASS SILAGE	38155	396	0	396		
PASTURED CROPLAND	17693	11:7	0	147		
Cropland used for pasture	14953	136	0	136		
Improved pasture	2740	11	0	11		
VEGETABLES, SWEET CORN, MELONS	129		0	20		
ORCHARDS	0	20	0	0		
BERRIES	2	0	0			
NURSERY & GREENHOUSE PRODUCTS	10	3	1	0		
OTHER CROPS	21	0	0	0		
Total Fertilizer Used, Tons		1092	10	1102		
Percent of Fertilizer Used		99	1	100		

## TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

	175	APPLIED					
Item	Tons	4	Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	4109	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	1)dda 5553	1972	6017	/00	7700		
Total	5553			602	6619		
Primary Nutrients in Fertilizer	3110	Ton	nages for Oti	er Recent Yea	rs		
Nitrogen	1306						
Phosphorus	902						
Potash	902						

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	1253	
Total Estim	ated Tons Applied on All Hi	ghways in 1972-73,

## TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides 269.7		scticides	Fungicides 31.7	Total 556.7	
Manure: Ki	ind of	Tons o				
Livesto	:k	Manure	Nitrogen	Phosphorus	Potash	
Swine: Tab	le 2	1146	7	2	5	
Cattle: Ta	ble 3	184050	1031	184	920	
Sheep: Tab	le 4	1610	23	3	16	
Horses: Ta	ble 4	38608	266	39	232	
Chickens:	Table 5	5264	82	21	18	
Turkeys: 7	able 5					
Total from Ton	District Control of the Control of t	230978	31409	249	1191	
Fertilizers	4	Tons of (	Commercial Fert	ilizers Applied		
			Primar	y Nutrients		
Ite	m	Total	Nitrogen	Phosphorus	Potash	
Applied on Table 7	Cropland:	5553	1306	902	902	

Lime: Limestone equivalent purchased or applied, tons: Table 8  $\underline{\phantom{0}}$  5619

Salts: Applied on all highways, tons: Table 9 1817

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0,453 ,4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Superior 1.0 STATE: Wisconsin PLANNING SUBAREA: West 1.1 COUNTY: Ashland

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	810	22.2	180	2.7		
Grains	1813	9.0	604	6.0		
Hay or Grass Silage	6570	65.7	51,75			
Pastured Cropland	2524	25.2	51,75 25214	25.2		
Other Field Crops						
Vegetables	1	-	1	4	1	2
Orchards						
Berries	1	.1	2	.1	2	.3
Nursery, Greenhouse				100		• -
Other Crops						
Totals	11719	122.2	8786	88.7	3	.3

TABLE 2--MANURE FROM SWINE

Hog & Pig	Aumber 30	ws Farrowing	
Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
361	30	30	60
195	18		42
250	25	25	50
	Dec. 1 361 195	Dec. 1 Spring 361 30 195 18	Dec. 1         Spring         Fall           361         30         30           195         18         2h

-		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	127///	6222	5922			
1969	8711	4517	4194			
1972	9500	1200	5300			
Wet Manure   Per Anima	Factor: Tons	13.14	6,45			
Wet Manure 1		55188	34185			
	Defecated: Tons, 1972 Net Manure: Nitrog Phosph Potash	en, tons 500 orus, tons 89	3			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	219	
1969	207	152
1972	207	800
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	322	10221
Nutrients in Wet Manure: Nitrogen, Tons	5	71
Phosphorus, Tons	1	10
Potash, Tons	3	61

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		8173		
1969		4010		
1972		600		
Wet Manure Facto	r: Lbs. per bird	82.9		
Wet Manure Defec	ated: Tons, 1972	25		
Nutrients in Wet	Nitrogen, tons	0	Combined	
	Phosphorus, tons	0		
	Potash, tons	0		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	s (1) 664192	Number I-V farms 227
Number of farms	341	Acres in I-V farms 62641
Acres in farms	79697	Cropland I-V farms 2588h
Cropland in farms	31799	Harvested cropland
Harvested cropland in f	arms 19863	I-V farms 17099

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	403	112	0	42
GRAINS	2623	142	0	289
Wheat	3	0	0	0
Oats	2548	281	0	281
Barley	72	8	0	8
Rye	0	0	0	0
OTHER FIELD CROPS	1	1	0	1
Soybeans				
Potatoes	1	1	0	3
Sugar beets				
Field beans	295	0	0	0
HAY OR GRASS SILAGE	13729	63	3	66
PASTURED CROPLAND	8637	63	0	25
Cropland used for pasture	7662	23	0	23
Improved pasture	975	2	0	2
VEGETABLES, SWEET CORN, MELONS	1	0	0	0
ORCHARDS	2	0	0	0
BERRIES	0	0	0	0
NURSERY & GREENHOUSE PRODUCTS	0	0	0	0
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		1,20	3	1,23
Percent of Fertilizer Used		99	1	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

THE PARTY OF THE P			APPLIED	THOTONE EQUIT	
Item	Tons		Tonnage	Tonnage not	-115
Fertilizer Used on Crops: Solid	532	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	125	1972			ont e
Total	657		6 0.1	2 11	2745
Primary Nutrients in Fertilizer	342	Ton	nages for Oth	er Recent Yea	rs
Nitrogen	89				
Phosphorus	96				
Potash	157				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Through State	"E" Mile
1970-71		
1971-72		
1972-73	2000	

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide	es I	Insecticides 88.7	Fungicides	Total 211.2
Manure: Ki	nd of	To	ns of Materia	ls in Wet Manure	
Livesto	k	Mant	re Nitrog	en Phosphoru	s Potas
Swine: Tab	1e 2	361	2	1	1
Cattle: Ta	ble 3	89373	500	89	147
Sheep: Tab	le 4	322	5	1	3
Horses: Ta	ble 4	10224	71	10	61
Chickens:	Table 5	25	0	0	0
Turkeys: 7	able 5	- T	-	-	-
Total from Tor		100305	578	101	512

Fertilizers:	Tons of	Commercial Fer	tilizers Applied	
		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potasi
Applied on Cropland: Table 7	657	89	96	157

Limestone equivalent purchased or applied, tons: Table 8 2745Lime:

Salts: Applied on all highways, tons: Table 9 2901

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING	AREA:	Lake	Superior	1.0	STATE:	Wisconsin
PLANNING	SUBAREA:	West	1.1		COUNTY:	Bayfield

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	360	9.9	80	1.2		
Grains	2719	13.5	906	9.0		
Hay or Grass Silage	9840	98.4	8200	82.0		
Pastured Cropland	3706	37.0	3706	37.0		
Other Field Crops	45	1.3		5.7	50	7.5
Vegetables	13	• 3	50 13	.7	13	.3
Orchards						
Berries	368	18.8	435	40.6	1438	89.5
Nursery, Greenhouse			1000			
Other Crops						
Totals	17051	179.2	12300	176.2	501	97.3

TABLE	2 454	ATTTTATE	TITLONE	CHIPPIN
LADIL	Z Little	NURE	PROTE	OMTME

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	181	15	23	38
1969	1/1	5/1	17	111
1972	200	30	30	60

Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons\_ Potash, tons\_

### TABLE 3-MANURE FROM CATTLE

H LLAN

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	19463	91:70	9993			
1969		6/105	6665			
1972	13067 14500	6100	8400			
Wet Manure F Per Animal	actor: Tons	13.14	6.45			
Wet Manure I Tons, 1972		80154	54180			
Wet Manure I Nutrients in	Defecated: Tons, 1972 Wet Manure: Nitroge Phospho	n, tons 752 rus, tons 131				

## TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	10/3	
1969		120
1972	376 350	200
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	564	2556
Nutrients in Wet Manure: Nitrogen, Tons	8	18
Phosphorus, Tons	1	3
Potash, Tons	6	75

#### TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	21.077		
1969 1972	10028 16000		
	10000		
Wet Manure Factor: Lbs. per bird	82.9 663		
Wet Manure Defecated: Tons, 1972	663		
Nutrients in Wet Manure: Nitrogen, tons	10	Combined	
Phosphorus, tons	3		
Potash, tons	2		-

TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 934272	Number I-V farms 306
Number of farms	1492	Acres in I-V farms 80722
Acres in farms	104912	Cropland I-V farms 38193
Cropland in farms	1,8933	Harvested cropland
Harvested cropland in far	ви 301/76	I-V farms 25320

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	278 3621 306	29	0	29
GRAINS	3621	310		370
Wheat	306	12	8	12
Oats	3206	285		310 12 285
Barley	88	12		12
Rye	16	2	0	2:
OTHER FIELD CROPS	12	3	0.	3
Soybeans				
Potatoes -	12	3	0	3
Sugar beets				
Field beans	530	0	0	0
HAY OR GRASS SILAGE	20731	65	0	65
PASTURED CROPLAND	11299	78	0	65 78
Cropland used for pasture	10776	78		78
Improved pasture	523	0		. 0
VEGETABLES, SWEET CORN, MELONS		.3		3
ORCHARDS	13 1463	3	5 0	56
BERRIES	35	7	0	7
NURSERY & GREENHOUSE PRODUCTS	36	9	0	9
OTHER CROPS	20	9	0	0
Total Fertilizer Used, Tons		558	2	560
Percent of Fertilizer Used		100	0	100

TABLE 7FERTILIZER	USED IN 1972	TABLE		MESTONE EQUIV	ALENT
Item	Tons		APPLIED Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	705	Year	Government	Government Cost/Shared	Total Tonnage
Liquid	165	1972			1,237
Total	870		nages for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	453				
Nitrogen	11.8				
Phosphorus	127				
Potash	208				

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2049	
Total Estimat	ted Tons Applied on All Hi	ghways in 1972-73,

#### TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide 179.2		nsecticides 176,2	Fungicides 97.3	Total
Manure: Kir Livestock		To Manu		ls in Wet Manure en   Phosphorus	
Swine: Tabl	e 2	Li32i	2	1	25
Cattle: Tab	1e 3	134334	752	134	672
Sheep: Tabl	e 4	564	8	1	6.
Horses: Table 4		2556	18	3	15
Chickens: Table 5		663	10	3	2
Turkeys: Table 5		-			-
Total from Livestock, Tons		138551	790	142	697
Fertilizers:		Tons o	f Commercial	Fertilizers Appli	led
				imary Nutrients	
Iten		Total	Nitrogen	Phosphorus	Potash
Applied on ( Table 7	Cropland:	870	118	127	208
	tone equiva	lent purc	hased or appl	ied, tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Li	ime and	Highway	De-Icing	Compounds
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PLANNING AREA:	Lake Superior 1.0	STATE: Wisconsin
PLANNING SUBAREA:	West 1.1	COUNTY: Douglas

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS.	1972	

Acres Treated	Amount Used	Acres	Amount		Amount
	100 lbs		Used 100 1bs	Acres Treated	Used
90	2.4	20	.3		
755	3.7	252	2.5		
7260	72.6	6050	60.5		
3020	30.2	3020	30.2		
L	.1	14	.2	h	.1
56	5.6	50	6.3	56	5.6
22200	111. 6	0204	100.0	(0)	5.7
	755 7260 3020 4 56	755 3.7 7260 72.6 3020 30.2 4 .1 56 5.6	755 3.7 252 7260 72.6 5050 3020 30.2 3020 4 .1 4 56 5.6 50	755 3.7 252 2.5 7260 72.6 6050 60.5 3020 30.2 3020 30.2 4 .1 4 .2 56 5.6 50 6.3	755 3.7 252 2.5 7260 72.6 6050 60.5 3020 30.2 3020 30.2 4 .1 4 .2 4 56 5.6 50 6.3 56

#### TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
ear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	517	37	46	83
969	322	84	35	119
972	325	60	60	120

Wet Manure Factor: Tons	per litter farrowed	7.23
Wet Manure Defecated: Ton	s, 1972	7.23 868
Nutrients in Wet Manure:	Nitrogen, tons	la .
	Phosphorus, tons	1
	Potash, tons	3

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves
1964	15770	6859	8911
1969	10205	4985	5220
1972	11000	3000	8000
Wet Manure Per Anima	Factor: Tons	13.14	6.45
Wet Manure Tons, 197		39420	51600
	Defecated: Tons, 1972 i Wet Manure: Nitroge Phospho Potash,	n, tons 510 rus, tons 91	20

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1000	
1969	457	187
1972	1000 457 450	187 500
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	724	
Nutrients in Wet Manure: Nitrogen, Tons	10	6390 Iili
Phosphorus, Tons	2	6
Potash, Tons	7	38

#### TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	11,390		
1969	13849		
1972	21,000		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	870		
Nutrients in Wet Manure: Nitrogen, tons	114	Combined	
Phosphorus, tons	3		
Potash, tons	3		

## TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	831,914	Number I-V farms	215
Number of farms	347	Acres in I-V farms	59906
Acres in farms	79147	Cropland I-V farms	29359
Cropland in farms	36853	Harvested cropland	
Harvested cropland in farms	21818	I-V farms	18303

	Crop	Tons o	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total		
CORN	83	4	0	4		
GRAINS	1700	228	0	228		
Wheat	51	7	0	7		
Oats	1579	210	0	210		
Barley	45	6	0	6		
Rye	0					
OTHER FIELD CROPS	11	7	0	7		
Soybeans	0					
Potatoes	11	7	0	7		
Sugar beets	0					
Field beans	258	0	0	0		
HAY OR GRASS SILAGE	19249	101	0	101		
PASTURED CROPLAND	10469	98	0	98		
Cropland used for pasture	9258	68	0	68		
Improved pasture	1211	30	0	30		
VEGETABLES, SWEET CORN, MELONS	h	1	0	1		
ORCHARDS	0	0	0	Ö		
BERRIES	56	6	0	6		
NURSERY & GREENHOUSE PRODUCTS	34	26	0	26		
OTHER CROPS	3	0	0	0		
Total Fertilizer Used, Tons		471	0	471		
Percent of Fertilizer Used		100	0	100		

## TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

TABLE / FURT LUL CUR	0000 111 1571	APPLIED					
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	592	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	139	1972			2825		
Total	731		E O-V	er Recent Yea			
Primary Nutrients in		100	nages for oth	er Recent lea	1.8		
Fertilizer	380						
Nitrogen	99						
Phosphorus	106						
Potash	175						

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2362	
	timated Tons Applied on All Hi mputed 3426	ighways in 1972-73,

# TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Chemicals:	Hundr	edweight Ap	oplied on Cr	opland	
	Herbicides	Inse	cticides	Fungicides	Total
Table 1	114.6	100	.0	5.7	220.3
Manure: Kir	nd of	Tons o	of Materials	in Wet Manure I	efecated
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Tabl	le 2	868	4	1	3
Cattle: Tal	ole 3	91020	510	91	455
Sheep: Tabl	Le 4	724	10	2	7
Horses: Tal	ole 4	6390	lili	6	38
Chickens: 7	Table 5	870	1/4	3	3
Turkeys: Ta	able 5				
Total from I		99872	582	103	506
Fertilizers:		Tons of Co	ommercial Fe	rtilizers Applie	d
			Prim	ary Nutrients	
Ites	n l	Total	Nitrogen	Phosphorus	Potasi
Applied on (	Propland:				

			LTIME	ity wurttenes	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on C Table 7	ropland:	731	99	106	175
Time: Time		1	and an english		-

Limestone equivalent Table 8 2825 Salts: Applied on all highways, tons: Table 9 3426

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING ARE	A: Lake Superior 1.	O STATE:	Wisconsin
PLANNING SUB	APPA:	COTBUILD.	

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS.	1972	

Herbicides		Insecticides		Fungicides	
Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
225	6.1	50	.7		
L8L	2.4	161	1.6		
1560	15.6	1300			
522	5.2	522			
225	6.7	250	28.7	250	37.5
3	.1	- 3	.2	3	.1
1	0	1	.1	1	.1
3020	36.1	2287	49.5	254	37.7 123.3
	Acres Treated 225 h8h 1560 522 225 3	Acres Treated 100 lbs  225 6.1 h8h 2.h 1560 15.6 522 5.2 225 6.7 3 .1	Acres Used 100 lbs Treated 225 6.1 50 h8h 2.h 161 1560 15.6 1300 522 5.2 5.2 255 6.7 250 3 .1 3	Acres Treated 100 lbs Acres 100 lbs 152 5.2 5.2 225 6.7 250 28.7 3 .1 3 .2	Acres Treated 100 lbs Acres 100 lbs Treated 100 lbs Treated 225 6.1 50 .7 lb8h 2.h 161 1.6 lb60 lb.6 1300 lb.7 225 6.7 250 28.7 250 3 .1 3 .2 3 lb 0 1 .1 1.0 lb 1 .1 1 lb 1 lb

#### TABLE 2--MANURE FROM SWINE

Dec. 1-May 31	7 7 32 50	
Spring	June 1-Nov. 30 Fall	Total
2	1	3
0	0	0
10	10	20
	2	2 1

### TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	2640	1238	1402
1969	1753	935	818
1972	2000	900	1100
Wet Manure I Per Animal	actor: Tons	13.14	6.45
Wet Manure I Tons, 1972		11826	7095
			1

## TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	0	
1969	0	48
1972	0	200
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	0	2556
Nutrients in Wet Manure: Nitrogen, Tons	0	14
Phosphorus, Tons	0	3
Potash, Tons	0	13

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	221/8		
1969			
1972	503 300		
Wet Manure Factor: Lbs. per bird	82.9		
wet Manure Defecated: Tons, 1972	12		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	0		
Phosphorus, tons	0		
Potash, tons	0		

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	1) 478016	Number I-V farms	40
Number of farms	66	Acres in I-V farms	13984
Acres in farms	18275	Cropland I-V farms	6306
Cropland in farms	7835	Harvested cropland	
Harvested cropland in far	ms 5023	I-V farms	1:063

	Crop	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	Total
CORN	50/1	17	0	17
GRAINS	706	60	0	60
Wheat	7	60	0	0
Oats	653 46	60	0	60
Barley	146	0	0	0
Rye	0	0	0	0
OTHER FIELD CROPS	299	264	0	264
Soybeans				
Potatoes	299	264	0	264
Sugar beets				
Field beans	В	0	0	0
HAY OR GRASS SILAGE	2830	5	0	5
PASTURED CROPLAND	1777	11	0	11
Cropland used for pasture	1660	7	0	7
Improved pasture	117	4	0	1
VEGETABLES, SWEET CORN, MELONS	3	0	0	0
ORCHARDS	1	0	0	0
BERRIES	0	0	0	0
NURSERY & GREENHOUSE PRODUCTS	0			
OTHER CROPS	0			
Total Fertilizer Used, Tons		357	0	357
Percent of Fertilizer Used		100	0:	100

## TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

		APPLIED			
Tons		Tonnage	Tonnage not		
1149	Year	Government Cost/Shared	.Government Cost/Shared	Total Tonnage	
105	1072			820	
551					
288	100	nages for Oth	er wecent rea	IS	
75					
81					
132					
	149 105 554	105 105 1972 Ton	Tonnage	Tons	

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2110	
Total Estimat	ted Tons Applied on All Hi	ghways in 1972-73,

## TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1 Herbici	des 1	insecticides	Fungicides 37.7	Total 123.3		
Table 1   36.1		47.00	2(+)	753.5		
Manure: Kind of	To	Tons of Materials in Wet Manure Defecated				
Livestock	Manu	re Nitroger	n Phosphorus	Potash		
Swine: Table 2	145		0	1		
Cattle: Table 3	18921	106	19	95		
Sheep: Table 4	0	0	0	0		
Horses: Table 4	2556	Ili	3	13		
Chickens: Table 5	12	0	. 0	0		
Turkeys: Table 5	0.	0	0	0		
Total from Livestock, Tons	21634	121	22	109		
Fertilizers:	Tons o	f Commercial Fe	ertilizers Applie	d		
		Prin	Primary Nutrients			
Item	Total	Nitrogen	Phosphorus	Potash		
Applied on Cropland: Table 7	554	75	81	132		

Lime: Limestone equivalent purchased or applied, tons:

Table 8 820
Salts: Applied on all highways, tons: Table 9 3060

To Convert From

Pounds (1b)
Acres (acre)
Tons (ton)

Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

### 4.3 Planning Subarea 1.2

Nine Michigan counties (Alger, Baraga, Chippewa, Houghton, Gogebic, Keweenaw, Luce, Marquette and Ontonagon), all of which border on the south shores of Lake Superior, comprise the planning subarea. Census information for Keweenaw County is not available. Total land area for the other eight counties equals 2,478,600 hectares (6,124,544 acres) with land in farms equaling 118,600 hectares (293,116 acres) or 5 percent of the total land area. National and state forests and recreation areas typify the area.

# 4.3.1 Agricultural Characteristics

Agriculture tends to be concentrated in selected locations rather than generally spread throughout PSA 1.2. Most of the cropland is used for hay and pasture. Oats is the major grain crop, especially in Chippewa County which grows more oats than the other eight counties combined.

Table 4-15 indicates the relative proportions of materials usage in the planning subarea as compared to the total U.S. Great Lakes Basin.

Table 4-15
MATERIALS USAGE BASIN RELATIONSHIP -- PSA 1.2 TO GREAT LAKES

Per harvested acre of cropland	Planning Subarea 1.	.2 Great Lakes Basin
Lbs of chemicals applied Index of chemicals used	1.16	2.66 100
Tons of livestock manure defecated Index of manure defecated	3.97 118	3.37 100
Lbs primary nutrients in livestock manur Index of primary nutrients in manure	ce 96 117	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	91 16 28	321 22 100
Lbs primary nutrients in commercial fert Index primary nutrients in commerical fer		153 100
Lbs of lime applied Index of lime used	174 102	170 100
Per acre of total land area Lbs road salts used Index road salts used	15.08 36	41.74
To Convert From To Pounds (1b) Kilograms ( Kilograms ( Metric Tons	(kg) 90	0.454 07.2 0.907

## 4.3.2 Materials Usage

The following table summarizes by county the material usage inventory for PSA 1.2. Tables 4-17 to 4-25 display detailed information.

Table 4-16 MATERIALS USAGE (in 1972)

PSA 1.2	Chemicals Applied to Crops (100 lbs)	Livestock Manure (tons)	Fertilizer on Cropland (tons)	Limestone Purchased or Applied (tons)	Salts Applied to all Highways (tons)
Michigan					
Alger	56	37,220	282	1,565	5,909
Baraga	49	28,625	226	1,008	4,529
Chippewa	311	116,677	1,237	1,750	9,844
Gogebic	28	16,673		490	5,142
Houghton	289	46,598	1,206	490	3,524
Keweenaw					517
Luce	84	14,338	149	68	1,820
Marquette	116	33,925	632	711	8,221
Ontonagon	102	58,704	238	1,655	7,194
TOTAL	1,035	352,890	4,040	7,737	46,700
To Convert 1	From		То	Mul	tiply By
Pounds (1b)	)	Ki	lograms (kg)		0.454
Tons (ton)		Ki	lograms (kg)	90	7.2
		Me	etric Tons		0.907

# 4.3.2.1 Agricultural Chemicals

There were 47,000 kilograms (103,500 pounds) of agricultural chemicals used in PSA 1.2. Herbicides represented 39 percent of the total, insecticides 44 percent, and fungicides 17 percent. The increased use of fungicide compared to PSA 1.1 was primarily for potatoes grown in Houghton and Marquette Counties. Herbicide use may increase about 10-15 percent in the next 10 years and fungicide use about 5-12 percent. Insecticide use on grain and forage crops may increase 30-40 percent in the next 5 years but decrease below present levels within 10 years.

### 4.3.2.2 Animal Wastes

There were 15,500 head of cows and heifers calved, and 14,800 head of other cattle in 1972. Cattle defecates 85 percent of the manure, horses 13 percent, and chickens and sheep 1 percent each. There were 320,136 metric tons (352,890 tons) of wet manure produced from livestock in PSA 1.2. This represents 30 percent of the total livestock manure produced in the Lake Superior basin. Nitrogen, phosphorus, and potash combined comprise 1.2 percent of the total manure tonnage. It is expected that livestock numbers will not change significantly in the next 10 years. If there are changes, it is most likely that the numbers will experience some decline. The manure production will continue at about the present levels or decline if livestock numbers continue to decrease.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

Lake Superior 1.0 STATE: Michigan \_\_ COUNTY: 9 County Totals (1) PLANNING SUBAREA: East 1.2

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used	Acres Treated	Amount Used 100 lbs	Acres Treated	Used 100 1bs
Corn				- 00	0	
Grains	8358	41	2786	27		
Hay or Grass Silage	20814	207	17345	174	0	
Pastured Cropland	12333	121	12333	121	0	700
Other Field Crops	1068	31,	1187	136	1187	177
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops		1				
Totals	L2573	1,00	33651	1458	11.87	177

	Hog & Pig	Number Son	ws Farrowing	
ear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
64	1306	102	36	138
169	1138	116	127	243
972	1123	11/4	130	2111

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 1761
Nutrients in Wet Manure: Nitrogen, tons 9 Phosphorus, tons Potash, tons\_

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	39919 27688	21088 1h158	18831 13530
1969 1972	30300	15500	14800
Wet Manure   Per Anima		13.14	6.45
Wet Manure		203670	95460
Wet Manure Nutrients i	Defecated: Tons, 1972 n Wet Manure: Nitroge Phospho Potash,	n, tons 1674 rus, tons 301	

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2035	
1969	3221	895
1972	2637	3503
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	4245	141768
Nutrients in Wet Manure: Nitrogen, Tons	59	309 145
Phosphorus, Tons	- 8	
Potash, Tons	1/1	268

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964 1969 1972		108438 63760 72000		
Wet Manure Factor: Lb Wet Manure Defecated:		82.9 2983		
Nutrients in Wet Manus Nitro Phosp		146 114 10	Combined	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (2)	67215111	Numb	er I-V fa		665	
Number of farms	1239	Acre	s in I-V		2031	
Acres in farms	293116		land I-V		17/190	09
Cropland in farms	159739	Harv	ested cro			
Harvested cropland in farms_	88955	THE STATE OF	I-A	farms_	7005	5
		Crop	Tons o	f Fert	ilizer	
		7.8550	The same	7 4 00	nd d	Tota

	Crop	Tons o	f Fertilizer	Used
Crops	Acres	Dry	Liquid	Total
	528	67	1	68
CORN	13328	1229	8	1237
GRAINS	135	12	1	13
Wheat	121111	1113	7	1120
Oats	352	31	0	31
Barley	266	29	0	29
Rye		591	0	591
OTHER FIELD CROPS	1275	274	0	0
Soybeans	0	508	0	508
Potatoes	1193	500	0	300
Sugar beets			-	77
Field beans	785	76	-	
HAY OR GRASS SILAGE	54208	31.7	0	317
PASTURED CROPLAND	35745	231	0	231
Cropland used for pasture	34406	215	0	215
Improved pasture	1339	16	0	16
VEGETABLES, SWEET CORN, MELONS	37	8	0	8
ORCHARDS	67	20	0	20
BERRIES	166	34	1	35
NURSERY & GREENHOUSE PRODUCTS	87	11	0	11
OTHER CROPS	3	0	0	0
Total Fertilizer Used, Tons		2574	11	2525
Percent of Fertilizer Used		100	0	100
rerealt of refullizer used				-

TN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

TABLE 7FERTILIZER USED IN 1972		TABLE	APPLIED	rusiona aque.	
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	3 3 9 1	Year	Government Cost/Shared	Cost/Shared	Total Tonnage
Liquid	646	1972	7647	90	7737
Total	hoho	Tor	mages for Oth	er Recent Yea	rs
Primary Nutrients in Fertilizer	1980				-
Nitrogen	652				
Phosphorus	633				
Potash	695				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

92	20.5
39	23.4
97	25.7
97 oplied on All Hig	hways in 1972-73,
	39

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides	Insec 158	cticides	Fungicides 177	Total 1035	
Manure: Ki	nd of	Tons o	Nitrogen	Phosphorus	Potash	
Swine: Tab		1764	9	2	7	
Cattle: Ta		299130	1674	301	1496	
Sheep: Tal		4245	59	8	41	
Horses: To		hh768	309	45	268	
Chickens:		2983	146	14	10	
Turkeys:		0				
	Livestock,	352890	2097	370	1822	
Fertilizer	3:	Tons of C		rtilizers Applie	d	
	District of the			ary Nutrients	1 2 1	
It	em	Total	Nitrogen	Phosphorus	Potasi	
Applied on Table 7	Cropland:	hoho	652	633	695	

Table 8 7737

Salts: Applied on all highways, tons: Table 9 46700

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

- (1) The totals are for 8 counties as information for Keweensw county, Michigan is not available.
- (2) County, land area, acres includes water areas under 40 acres in size.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Superior 1.0 STATE: Michigan

PLANNING SUBAREA: East 1.2 COUNTY: Alger

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

Herbi	cides	Insect	icides	Fungi	cides
Acres Treated	Amount Used 100 Ibs			Acres Treated	Amount Used 100 1bs
630	3	210	2		
1609	1.6	1341	13		
17.07	11	1107	11		
3346	30	2658	26		
	Acres Treated 630 1609 1107	Acres Used 100 lbs 630 3 1609 16 1107 11	Acres Used 100 lbs Treated  630 3 210 1609 16 1341 1107 11 1107	Acres Used Acres Used Treated 100 lbs Treated 100 lbs Treated 100 lbs 16. 13 ll 13 1107 11	Acres Treated 100 lbs Treated

TABLE 2--MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	69	16	3	1.9
1969	78	6	11	17
1972	78	6	11	17

Wet Manure Factor: Tons per litter farrowed 7,23
Wet Manure Defecated: Tons, 1972 123
Nutrients in Wet Manure: Nitrogen, tons 1
Phosphorus, tons 0
Potash, tons 0

TABLE 3-MANURE FROM CATTLE

	Number Cattle and Calves				
Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves			
3850	1870	1980			
	1366	2092			
3800	1500	2300			
ctor: Tons	13.14	6,45			
fecated:	19710	14835			
fecated: Tons, 1972 Wet Manure: Nitroge	Combined: 34545 en, tons 193	14835			
	3850 3158 3800 actor: Tons efecated: efecated: Tons, 1972 Wet Manure: Nitroge	Total Cows & Heifers Calved  3850 1870 3158 1366 3800 1500 actor: Tons 13.1h  efecated: 19710  efecated: Tons, 1972 Combined: 31515  Wet Manure: Nitrogen, tons 193			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	52	
1969	92	63
1972	92	158
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	148	2019
Nutrients in Wet Manure: Nitrogen,	Tons 2	11/
Phosphoru	s, Tons	2
Potash, T	ons 1	12

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	16758		
1969	8346		
1972	9300		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	385		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	6		
Phosphorus, tons	2		
Potash, tons	1		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	1) 578880	Number I-V farms	63
Number of farms	104	Acres in I-V farms	19683
Acres in farms	25116	Cropland I-V farms	9908
Cropland in farms	13081	Harvested cropland	
Harvested cropland in far	ms 6857	I-V farms	6131

	Crop	Tons o	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	Tota	
CORN	152	13	0	13	
GRAINS	1171	113	0	113	
Wheat	0				
Oats	1091	105	0	105	
Barley	45	8	0	8	
Rye	0	0	0	0	
OTHER FIELD CROPS	8	14	0	4	
Soybeans					
Potatoes					
Sugar beets				-	
Field beans					
HAY OR GRASS SILAGE	4796	25	0	25	
PASTURED CROPLAND	3740	16	0	16	
Cropland used for pasture	3423	11	0	1/1	
Improved pasture	317	2	0	5	
VEGETABLES, SWEET CORN, MELONS	0	0	0	0	
ORCHARDS	7	0	0	0	
BERRIES	214	4	0	14	
NURSERY & GREENHOUSE PRODUCTS	11	1	0	1	
OTHER CROPS	0	0	- 0	0	
Total Fertilizer Used, Tons		176	0	176	
Percent of Fertilizer Used		100	0	100	

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

TABLE /- FERTILIZER C	SED IN 1912	1710111	APPLIED		TOTAL STATE OF THE PARTY OF THE
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	237	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	45	1972	7.565	0	1565
Total	282		1000000	er Recent Yea	
Primary Nutrients in Fertilizer	138	100	linages for our	100000000000000000000000000000000000000	-
Nitrogen	46	-			
Phosphorus	144				
Potash	48				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	3151	25.7
1971-72	3229	26.5
1972-73	4074 imated Tons Applied on All Hi	31.1

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HICHWAY DE-ICING

	Herbicides	Insecticides		Fungicides	Total
Table 1	30	26		0 1	56
Manure: Kind of		Tons of Materials			
Livestock		Manure	Nitroge	n Phosphorus	Potash
Swine: Tabl	e 2	123	1	0	0
Cattle: Tab		34545	193	35	173
Sheep: Tabl		11/8	2	0	1
Horses: Tab		2019	7/1	2	12
Chickens: 1		385	6	2	1
Turkeys: Ta		0	0	0	0
Total from Livestock, Tons		37220	216	39	187
Fertilizers		Tons of C		ertilizers Applied	
				mary Nutrients	
Iten	n:	Total	Nitrogen	Phosphorus	Potash
Applied on ( Table 7	Cropland:	282	46	14	48
Lime: Limes	stone equivale	nt purchas	ed or appli	ed, tons:	

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Superior 1.0 STATE: Michigan PLANNING SUBAREA: East 1.2

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn						
Grains	240	1	80	1		
Hay or Grass Silage	1307	13	1089	11		
Pastured Cropland	952	10	952	10		
Other Field Crops	9	0	10	1	10	2
Vegetables						
Orchards						
Berries						-
Nursery, Greenhouse						
Other Crops						
Totals Total Herbicides, In	2508	5/1	2131	23 00 1bs	10	2 49

TARIF	2.	-MANURE	FROM	SWINE

Year	Hog & Pig	Number Sows Farrowing			
	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	10	2	0	2	
1969	20	0	0	0	
1972	20	0	0	0	

Wet Manure Factor: Tons per litter farrowed\_ Wet Manure Defecated: Tons, 1972\_ Nutrients in Wet Manure: Nitrogen, tons\_ Phosphorus, tons Potash, tons

	Number Cattle	Number Cattle and Calves			
Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
3363	1897	1466			
	1232	875			
2300	1700	900			
actor: Tons	13.14	6.45			
efecated:	18396	5805			
efecated: Tons, 1					
	3363 2107 2300 actor: Tons efecated:	Total Cows & Heifers Calved  3363 1897 2107 1232 2300 1h00 actor: Tons 13.14 efecated: 18396			

THE AMBUIDE WOOM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	7	
1969	5	55
1972	5	331
Wet Manure Factor: Tons per animal	1,61	12.78
Wet Manure Defecated: Tons, 1972	8	4230
Nutrients in Wet Manure: Nitrogen,	Tons 0	29
Phosphorus		1
Potash, To		25

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	3697		
1969	Li603		
1972	1,500		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	186		
Nutrients in Wet Manure: Nitrogen, tons	3	Combined	
Phosphorus, tons	1		
Potash, tons	1	The second	-

COUNTY: Baraga TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	(1) 576512	Number I-V farms	
Number of farms	162	Acres in I-V farms	
Acres in farms	24952	Cropland I-V farms	
Cropland in farms	10879	Harvested cropland	
Harvested cropland in f		I-V farms_	3100

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
The same of the sa	2	0	0	0
CORN	566	58	0	58
GRAINS	700			
Wheat	1493	56	0	56
Oats	73	2	0	2
Barley	12			
Rye	10	7	0	7
OTHER FIELD CROPS	10			
Soybeans	10	7	0	7
Potatoes	10	-		
Sugar beets	7.0	0	0	0
Field beans	10	7	0	7
HAY OR GRASS SILAGE	2519	67	0	67
PASTURED CROPLAND	5/1/10		0	63
Cropland used for pasture	2202	63	0	1
Improved pasture	238	11	0	2
VEGETABLES, SWEET CORN, MELONS	6	2		0
ORCHARDS	11	0	0	0
BERRIES	5	0	0	0
NURSERY & GREENHOUSE PRODUCTS	0			-
OTHER CROPS	0		-	11/1
Total Fertilizer Used, Tons		1/11	0	
Percent of Fertilizer Used		100	0	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

Item	Tons
Fertilizer Used on Crops: Solid	190
Liquid	36
Total	226
Primary Nutrients in Fertilizer	111
Nitrogen	36
Phosphorus	36
Potash	39

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total	
1972	1008	0	1008	
Ton	nages for Oth	er Recent Yes	rs	
			-	

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2119	20.2
1971-72	3086	29.6
1072-73	3122	28.7
Total Estima As Comput	ted Tons Applied on All Hi	ighways in 1972-73,

Herbicide	es In	secticides	Fungicides	Total		
Table 1 2h		23	2	1,9		
Manure: Kind of	Ton	s of Materials	s in Wet Manure D	efecated		
Livestock	Manur			Potash		
Swine: Table 2	0	0	0	0		
Cattle: Table 3	24201	135	5/4	121		
Sheep: Table 4	8	0	0	0		
Horses: Table 4	4230	29	14	25		
Chickens: Table 5	186	3	1	1		
Turkeys: Table 5	0	0	0	0		
Total from Livestock, Tons	28625	167	29	147		
Fertilizers:	Tons of		ertilizers Applie	d		
		Pri	mary Nutrients			
Item	Total	Nitrogen	Phosphorus	Potash		
Applied on Cropland: Table 7	226	36	36	39		

Salts: Applied on all highways, tons: Table 9 4529

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA:	Lake Superior 1.0	STATE:	Michigan
PLANNING SUBAREA:	East 1.2	COUNTY:	Chippewa

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn						
Grains	1572	23	1524	15		
Hay or Grass Silage	9333	93	7778	78		
Pastured Cropland	5068	51	5068	51		
Other Field Crops						
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse	77					
Other Crops						
Totals	18973	167	11,370	11/1		

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Soy	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	621	32	9	41
969	509	66	74	140
1972	500	65	75	140

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 1012
Nutrients in Wet Manure: Nitrogen, tons 5
Phosphorus, tons 1
Potash, tons 4

TABLE 3--MANURE FROM CATTLE

		Number Cattl	Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	12535	6281	6254			
1969	9215	4581	4634			
1972	10100	5000	5100			
Wet Manure Per Anima	Factor: Tons	13.14	6,45			
Wet Manure 1 Tons, 197		65700	32895			
			5			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1741	
1969	2759	457
1972	2200	1028
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	3542	13138
Nutrients in Wet Manure: Nitrogen, Ton	is 50	91
Phosphorus, 7		13
Potash, Tons	35	79

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		33400		
1969		8823		
1972		9700	A	
Wet Manure Facto	or: Lbs. per bird	82.9		
wet Manure Defe	cated: Tons 1972	390	100	
Nutrients in Wet	: Manure:		Combined	100
	Nitrogen, tons	6		
	Phosphorus, tons	2		
	Potash, tons	1		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1) 10177 Number of farms hold Acres in farms 9505 Cropland in farms 67655 Harvested cropland in farms 39636	Acre Crop	Number I-V farms 208 Acres in I-V farms 68209 Cropland I-V farms 19913 Harvested cropland I-V farms 31335			
	Crop	Tons o	f Fertilize	r Used	
Crops	Acres	Dry	Liquid	Total	
CORN	Sh	2	1	3	
GRAINS	6375	532	6	538	
Wheat	89	8	0	8	
Oats	5805	472	6	177	
Barley	102	10	0	10	
Rye	0				
OTHER FIELD CROPS	10	5	0	5	
Soybeans					
Potatoes	5	h	0	10	
Sugar beets					
Field beans	666	8	1	19	
HAY OR GRASS SILAGE	24533	147	.0	147	
PASTURED CROPLAND	14858	77	0	71	
Cropland used for pasture	14656	71	0	73	
Improved pasture	202	0	0	0	
VEGETABLES, SWEET CORN, MELONS	0	0	0	0	
ORCHARDS	0	0	0	0	
BERRIES	3	0	0	0	
MIDOURY & CREENHANCE PROPRIET	1			100	

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

BERNIES

NURSERY & GREENHOUSE PRODUCTS

OTHER CROPS

Total Fertilizer Used, Tons

Percent of Fertilizer Used

TABLE /FERTILIZER C	15EU IN 1972	APPLIED				
Item	Tons		Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	1039	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	198	1972	1700	50	1750	
Total	1237			er Recent Yea		
Primary Nutrients in Fertilizer	606	101	mages for our	Ne Cent Tea	**	
Nitrogen	200					
Phosphorus	194					
Potash	212					

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	3451	13.5
1971-72	11/20	17.4
1972-73	6787	25.1
Total Estima As Comput	ted Tons Applied on All F	Highways in 1972-73,

	Herbicides		secticides	Fungicides	Total
Table 1	167		this I	0	311
Manure: Kind	of	Tons	s of Materials	in Wet Manure De	fecated
Livestock		Manure	e Nitrogen	Phosphorus	Potash
Swine: Table	2	1012	5	1	14
Cattle: Table	3	98595	552	99	493
Sheep: Table	4	3542	50	7	35
Horses: Table	4	13138	91	13	79
Chickens: Tab	le 5	390	6	2	1
Turkeys: Tabl	e 5	0	0	0	0
Total from Liv Tons	estock,	116677	704	122	612
Fertilizers:		Tons of	Commercial Fer	tilizers Applied	
			Prima	ry Nutrients	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on Cro	pland:	1237	200	194	212

To Convert From

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 9844

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Superior 1.0 STATE: Michigan

PLANNING SUBAREA: East 1.2 COUNTY: Gogebic

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Grops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn						
Grains	120	1	ho	0	0	
Hay or Grass Silage	1035	70	862	9	0	
Pastured Cropland	1/1/9	1	1/19	ls .	0	
Other Field Crops			White and			
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals .	1604	15	1351	13	2955	28

TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	101	3	2	5
1969	2	0	0	0
1972	0	.0	0	0

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 0
Nutrients in Wet Manure: Nitrogen, tons 0
Phosphorus, tons 0
Potash, tons 0

TABLE 3-MANURE FROM CATTLE

			Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	2378	1179	1199			
1969	1159	657	502			
1972	1300	700	600			
Wet Manure Fa Per Animal	ctor: Tons	13.14	6.45			
Wet Manure De Tons, 1972	fecated:	9198	3870			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2	
1969	0	142
1972	0	281
Wet Manure Factor: Tons per animal	0	12.78
Wet Manure Defecated: Tons, 1972	0	3591
Nutrients in Wet Manure: Nitrogen, Tons	0	25
Phosphorus, Tons	0	1
Potash, Tons	0	22

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	51,85		
1969	51,85 2000		
1972	3500		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	21.5		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	2	The same of the sa	
Phosphorus, tons	1		
Potash, tons	1	1 12	-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	(1) 7081/80	Number I-V farms	31
Number of farms	73	Acres in I-V farms	7061
Acres in farms	11685	Cropland I-V farms	3753
Cropland in farms	5927	Harvested cropland	Coules
Harvested cropland in f	arms 3747	I-V farms_	2581

	Crop	Tons o	f Fertilizer	Used
Crops	Acres	Dry	Liquid	Tota
CORN	2/4	4	0	14
GRAINS	229	27	0	27
Wheat				
Oats	213	25	0	25
Barley				
Rye				
OTHER FIELD CROPS	. 4	1	0	1
Soybeans				
Potatoes	4	1	0	1
Sugar beets				-
Field beans				-
HAY OR GRASS SILAGE	2321	10	0	10
PASTURED CROPLAND	1054	2	0	2
Cropland used for pasture	1039		0	
Improved pasture	15	0	0	0
VEGETABLES, SWEET CORN, MELONS				
ORCHARDS				
BERRIES				_
NURSERY & GREENHOUSE PRODUCTS				-
OTHER CROPS				
Total Fertilizer Used, Tons		144	0	1111
Percent of Fertilizer Used		100	0	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons	-	Tonnage	Tonnage not	T-10-10
Fertilizer Used on Crops: Solid	59	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	11	1972	1,90	0	1190
Total	70		pages for Oth	er Recent Yes	re
Primary Nutrients in Fertilizer	34	100	mages for oth	The Court of Court	-
Nitrogen	11				-
Phosphorus	11				
Potash	12				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1660	11.5
1971-72	1844	12.9
1972-73	3545	23.3

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Inse	ecticides	Fungicides	Total
Table 1	15		13	0	28
Manure: K	ind of	Tons	of Materials	in Wet Manure De	fecated
Livesto	ck	Manure	Nitrogen	Phosphorus	Potash
Swine: Tal	ble 2	0	0	0	0
Cattle: T	able 3	13068	73	13	65
Sheep: Tal	ble 4	0	0	0	0
Horses: T	able 4	3591	25	1	22
Chickens:	Table 5	145	2	1	1
Turkeys:	Table 5	0	0	0	0
Total from To:	Livestock,	16803	100	18	88
Fertilizer	s:	Tons of	Commercial Fer	tilizers Applied	1
			Prima	ry Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potasi
Applied on Table 7	Cropland:	70	11	11	12

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9\_\_\_\_

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: Michigan PLANNING AREA: Lake Superior 1.0 PLANNING SUBAREA: East 1.2 COUNTY: Houghton

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn						
Grains	1296	6	432	4	0	
Hay or Grass Silage	2625	26	2187	22	0	
Pastured Cropland	1164	12	1164	12	0	
Other Field Crops	639	19	71.0	82	710	106
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	3324	63	14193	120	710	106

FET A TO T. TO	2MANURE	TOTAL	CHITATE

	Hog & Pig	Number Sov	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	37	3	2	5
1969	23	3	5	8
1972	20	3	1	7

Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons\_
Phosphorus, tons\_ Potash, tons\_

Year Tot 1964 644 1969 344 1972 370	1	Cows & Heifers Calved	Heifers, Steers Bulls, Calves 2h20
1969 344			21,20
	-		
1972 277	_	1987	1454
17/2 1 3/0	0	2200	1500
Wet Manure Factor: Per Animal	Tons	13.14	6.45
Wet Manure Defecated Tons, 1972	:	28908	9675

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	7.07	
1969	327	119
1972	300	119 515
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	483	6582
Nutrients in Wet Manure: Nitrogen, Tons	7	45
Phosphorus, Tons	1	7
Potash, Tons	5	39

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		26005		
1969		19470		
1972		21700		
Wet Manure Factor: I	bs. per bird	82.9		
wet Manure Defecated:	Tons. 1972	899		
Nutrients in Wet Many	ire:		Combined	
	rogen, tons	2/4		
Phos	phorus, tons	4		
Pota	ash, tons	3		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1	650880	Number I-V farms	135
Number of farms	274	Acres in I-V farms	29345
Acres in farms	45906	Cropland I-V farms	15693
Cropland in farms	22944	Harvested cropland	
Harvested cropland in farm	s 12782	I-V farms	9863

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	67	13	0	13
GRAINS	2079	264	1	265
Wheat	21	4	0	14
Oats	1975	248	1	249
Barley	74	10	0	10
Rye		1	0	368
OTHER FIELD CROPS	777	368	0	368
Soybeans				
Potatoes	708	358	0	358
Sugar beets				
Field beans	50	0	0	0
HAY OR GRASS SILAGE	6756	23	0	23
PASTURED CROPLAND	1:309	46	0	16
Cropland used for pasture	3963	40	0	40
Improved pasture	346	6	0	6
VEGETABLES, SWEET CORN, MELONS		0	0	0
ORCHARDS	8	0	0	0
BERRIES	123	28	1	29
NURSERY & GREENHOUSE PRODUCTS	30	10	0	10
OTHER CROPS				
Total Fertilizer Used, Tons		752	2	754
Percent of Fertilizer Used		100	0	100

Ni

ABLE 7FERTILIZER U	SED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
ertilizer Used on Crops: Solid	1.013	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	193	1972	1490	0	1490
otal	1200	Ton	nages for Oth	er Recent Yea	rs
rimary Nutrients in Fertilizer	591				-
itrogen	195	_			
hosphorus	189				
otash	207				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile	
1970-71	1871	16.2	
1971-72	2366	20.6	
1972-73	2430	19.8	
Total Estima As Comput	ted Tons Applied on All Hi	ghways in 1972-73,	

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Inse	ticides	Fungicides	Total
Table 1	63	120		106	289
Manure: K	ind of	Tons o	of Materials	in Wet Manure De	
Livesto	ck	Manure	Nitrogen	Phosphorus	Potash
Swine: Ta		51	.0	0	0
Cattle: T		38583	216	39	193
Sheep: Ta		483	7	1	5
Horses: T		6582	145	7	39
Chickens:		899	14	4	3
Turkeys:		0	0	0	0
	Livestock,	46598	282	51	240
Fertilizer	s:	Tons of Co		tilizers Applied	1
It	em	Total	Nitrogen	Phosphorus	Potasi
	Cropland:	7206	705	189	207

1206 195 189 Lime: Limestone equivalent purchased or applied, tons: Table 8

Salts: Applied on all highways, tons: Table 9 3524

# GREAT LAKES BASIN MATERIAL USAGE INVENTORY Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Superior 1.0 STATE: Michigan

TABLE 1ESTIMATED A	MODELTS OF CHEM		SUBAREA:	East 1	1.2	TABLE 6CROF						bulated) ENSUS FARMS,	1969
TABLE 1ESTIMATED A	Herbicides		cticides		cides	COUNTY, land					r I-V		
Crop Group	Amoun		Amount		Amount	Number of far	area, ac	res				V farms	
or	Acres Used	The second secon	2 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	Acres	Used	Acres in farm				Cropl	and I-	V farms	
Crops	Treated 100 1	lbs Treate	d 100 lbs	Treated	100 lbs	Cropland in	farms			_ Harve		ropland V farms	
Corn			-			Harvested cro	opland in	farms			4-	v rarms	
Grains Hay or Grass Silage			+						C	rop	Tons	of Fertilize	
Pastured Cropland		-					Crops		A	cres	Dry	Liquid	Tota
ther Field Crops					0.000	CORN							
/egetables						GRAINS							
rchards			-			Wheat			-				
Serries Nursery, Greenhouse						Oats			-			1	-
Other Crops						Barley Rye	-		1				
						OTHER FIELD	CROPS						
						Soybeans							
			-			Potatoes							-
Totals						Sugar beet			-		-		-
Total Herbicides, In	secticides, Fur	ngicides:	100 lbs			Field bean			1				
						PASTURED CRO							
TABLE 2MANURE FROM	M SWINE		-			Cropland u		asture					
Hog & Pi	Number	Sows Farro	wing			Improved p	asture		-			-	-
Inventor	O		-Nov. 30			VEGETABLES,	SWEET COR	N, MELONS	-			-	
Year Dec. 1	Spring		a11	Tot	a1	ORCHARDS BERRIES							
1964						NURSERY & GR	EENHOUSE	PRODUCTS					
1969						OTHER CROPS							
1972						Total Fertil							
Wet Manure Factor:		r farrowed				Percent of F	ertilizer	used					
Wet Manure Defecate	d: Tons, 1972_					TABLE 7-FER	TTT T 7 P P 1	SED IN 1972	TARLE	8CRO	IND LIN	ESTONE EQUIV	ALENT
Nutrients in Wet Ma		us, tons		-	-	TABLE /FER	THE LEEK C	OLD IN LYTE	Truth		LIED		
	Potash,		-		1 2 2 2	Item		Tons		Tonn	0.00	Tonnage not	
						Fertilizer U	end			Govern		Government	Total
						on Crops:			Year	Hoose Charles		Cost/Shared	Tonnage
TABLE 3-MANURE FRO	M CATILE						Liquid		1972				
		Numbe	er Cattle a	md Calves	0	Total			Tor	nages f	or Othe	r Recent Yea	rs
		Cows & He			, Steers,	Primary Nutr	ients in		1	li o g o o			
Year To	tal	Cal	red	Bulls	, Calves	Fertilizer Nitrogen	-						
1964						Phosphorus							
1969						Potash							
1972													
Wet Manure Factor:	Tons					minum 0 011	me amor r	en mo penena	r cmar	TE COUN	TV 6 1	MUNICIPAL HI	THWAYS
Per Animal						TABLE 3SAL	113 MITHE	DD TO TEDUTO	u, orn	10000			
Wet Manure Defecate	d:							Tons Purcha	sed		Tons	Applied Per E" Mile	
Tons, 1972						Year		Through St	ate	_	- "	E" Mile	
Wet Manure Defecate						1970-71							
Nutrients in Wet Ma						1971-72							
		rus, tons_				1972-73		ons Applied	on 411	II f olygan	o in T	972-73	-
	Potash,	tons					mputed I	ons Applied	on All	nighway	8 111 1	312-13,	
						155 00	mpureu						
TABLE 4MANURE FRO	M SHEEP AND HOR	RSES											
			Sheep &	Hors	es &	mant 2 10 C	TORKADY OF	ACREMIT THE	AT MATE	PTALS A	ND HTCE	WAY DE-ICING	
Year	Item		Lambs	Pon	ies	IABLE 10S	UPPLIANT OF	HORLGODAOR	TOU EMELL	ALLEI OF THE			
1964						Chemicals:		Hundredweigh	t Appl	ied on (	Croplan	d	-
1969							Herbic	ides [	nsecti	cides	Fu	ngicides	Total
1972						Table 1	HULDEU						
Wet Manure Factor:	Tons per anima	al				Manure: Ki	nd of	TV TV	ne of	Mararia	e in W	et Manure De	fecated
Wet Manure Defecate	d: Tons, 1972					Livestoc		Manu	and the same of the same of	Nitroge		Phosphorus	Potash
Nutrients in Wet Ma						Swine: Tab		7,00033	-				
		rus, Tons				Cattle: Ta	ble 3						
	Potash,	ions		-		Sheep: Tab							
TABLE 5MANURE FRO	M CUTCERNS & TI	ITDVDVC				Horses: Ta					-		-
THE STREET	ouronano a 1	O I O I I I I I I I I I I I I I I I I I		-		Chickens: Turkeys: T							
100-1101				Turkey	Turkeys	Total from	Livestock						
Year	Item	Chic	kens	Hens	Raised	Ton		(6)					
1964						Fertilizers		Tone	of Com-	ercial	Fertili	zers Applied	
1969						TOTALLAGIS		AULUS (	Johnson			lutrients	
1972						Ite		Total	N	itrogen		hosphorus	Potash
Wet Manure Factor:						Applied on	Cropland:						
Wet Manure Defecate	ed: Tons, 1972					Table 7		1					
Nutrients in Wet M			C	ombined		Lime: Lime	stone equ	ivalent pur	chased	or appl	ied, to	ons:	PARTIES TO
	trogen, tons		-			Tabl	e 8			11000			
	otash, tons			-		Colbar I	1101	11 beat	Townson.	7.4	0		
-	anny conto			-		Salts: App	iled on a	ill highways	tons	rable	9		
										-	-		
		1	To Convert	From		To.	Moderates	ar Day				land area, s water area	
		4		1/00/00/00		<u>ro</u>	Multipl	The same of the sa				s water area	o diuci
			Pounds (			ams (kg)	0.4				=		
72			Acres (a		Hectar	e (ha) ams (kg)	907.2						

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Superior 1.0 STATE: Michigan
PLANNING SUBAREA: East 1.2 COUNTY: Luce

TABLE 1 PETTMATER AMOUNTS OF CHEMICALS HEED ON CROPS 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops		Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn						
Grains	60 805	0	20 671	0	0	
Hay or Grass Silage		8		7	0	
Pastured Cropland	679	7	679	7	0	
Other Field Crops	171	5	190	22	190	28
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
			7010	24	200	28
Totals Total Herbicides, In	1715	20	1560	36	190 3465	811

TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	81	5	8	13
1969	29	2	0	2
1972	25	2	0	2

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 14
Nutrients in Wet Manure: Nitrogen, tons 0
Phosphorus, tons 0
Potash, tons 0

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Ca				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	11,76	817	659			
1969	1.06/1	558	506			
1972	1200	600	600			
Wet Manure I Per Animal	Pactor: Tons	13.14	6.45			
Wet Manure I Tons, 1972		7884	3870			
	Defecated: Tons, 1972 Wet Manure: Nitroge	en, tons 66				
	Phospho Potash,	rus, tons 12 , tons 59				

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	311	
1969	22	28
1972	20	173
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	32	2211
Nutrients in Wet Manure: Nitrogen, Tons	0	15
Phosphorus, Tons	0	2
Potash, Tons	0	13

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	5699		
1969	6000		
1972	7900		
Wet Manure Factor: Lbs. per bird	82.9		
wet Manure Defecated: Tons, 1972	327		
Nutrients in Wet Manure:	100	Combined	
Nitrogen, tons	5		
Phosphorus, tons			
Potash, tons	1		

TABLE 6-- CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	£80096	Number I-V farms 22
Number of farms	29	Acres in I-V farms 10536
Acres in farms	12305	Cropland I-V farms 5118
Cropland in farms	6891	Harvested cropland
Harvested cropland in fa	rms 321,0	I-V farms 2786

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN				
GRAINS	286	19	1	20
Wheat	23	0	1	1
Oats	161	19	0	1.9
Barley	50 52	0	0	0
Rye	52	0	0	0
OTHER FIELD CROPS	190	68	0	68
Soybeans				
Potatoes	190	68	0	68
Sugar beets				
Field beans				
HAY OR GRASS SILAGE	2232	0	0	0
PASTURED CROPLAND	1921	0	0	0
Cropland used for pasture	1904	0	0	0
Improved pasture	17	0	0	0
VEGETABLES, SWEET CORN, MELONS	22 10	5	0	5
ORCHARDS	10	0	0	0
BERRIES	2	0	0	0
NURSERY & GREENHOUSE PRODUCTS	145	0	0	0
OTHER CROPS				
Total Fertilizer Used, Tons		92	1	93
Percant of Fertilizer Used		99	1	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

TABLE /FERTILIZER (	DED IN 14	LABLE	0
Item	Tons		T
Fertilizer Used on Crops: Solid	125	Year	Cos
Liquid	24	1972	
Total	149	- Internal and a contract of	nage
Primary Nutrients in Fertilizer	73	100	llage
Nitrogen	24		_
Phosphorus	23		
Potash	26		

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
1972	68	0	68
	nages for Oth	er Recent Yea	TS
			-

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Tons Purchased Through State	Tons Applied Per "E" Mile
1116	15.4
1117	15.6
1255	16.1
ted Tons Applied on All H	
	Through State 1116 1117 1255

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	In	secticides	Fungicides 28	Total
Table 1	20		36	20	.04
Manure: Ki	nd of	Ton	s of Material	s in Wet Manure D	
Livesto		Manur	e Nitroge	n Phosphorus	Potash
Swine: Tab		14	0	0	0
Cattle: Ta		11754	66	12	59
Sheep: Tab		32	0	0	0
Horses: Ta		2211	15	2	13
Chickens:		327	. 5	1	1
Turkeys: 7		0			
Total from Tor	Livestock,	14338	86	15	73
Fertilizers	:	Tons of	Commercial F	ertilizers Applie	d
			Pri	mary Nutrients	
Ite	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	1119	5/1	23	26

Lime: Limestone equivalent purchased or applied, tons:
Table 8 68

Salts: Applied on all highways, tons: Table 9 1820

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds

PLANNING AREA:	Lake Superior 1.0	STATE:	MICHIGAN
PLANNING SUBAREA:	East 1.2	COUNTY:	Ontonagon
LIMBING CONSTRUCT.		100	

TABLE 1 PSTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn					0	
Grains	840	4	280	3	0	
Hay or Grass Silage		30	21487	25	0	
Pastured Cropland	1980	20	1980	20	0	
Other Field Crops						
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	5805	521	1717	48	0	0
Total Herbicides, In				00 lbs	10552	102

	Hog & Pig	Number Son	ws Farrowing	
Tear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	113	77	5	16
1969	129	12	8	20
1972	100	10	10	20

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	71414	3816	3628		
1969	5015	2692	2323		
1972	5500	2900	2600		
Wet Manure l	Factor: Tons	13.1h	6.45		
Wet Manure 1		38106	16770		
		n, tons 307			
	Phospho Potash,				

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	8	
1969	2	23
1972	0	248
Wet Manure Factor: Tons per animal	0	12.78
Wet Manure Defecated: Tons, 1972	0	3169
Nutrients in Wet Manure: Nitrogen, Tons	0	22
Phosphorus, Tons	0	3
Potash, Tons	0	19

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964 1969	10765 11289		
1972	12400		
Wet Manure Factor: Lbs. per bird Wet Manure Defecated: Tons, 1972	82.9 514		
Nutrients in Wet Manure: Nitrogen, tons	8	Combined	
Phosphorus, tons Potash, tons	2 2		#/

TABLE 6 CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres(1)	81,201,8	Number I-V farms 113
Number of farms	119	Acres in I-V farms 35302
Acres in farms	1,9231	Cropland I-V farms 16207
Cropland in farms	22121	Harvested cropland
Harvested cropland in farm	s 11.743	I-V farms 9762

	Crop	Tons o	f Fertilizer	Total
Crops				
CORN	16	0	0	0
GRAINS	1429	126	0	126
Wheat	1	0	0	0
Oats	1375	121	0	121
Barley	8	1	0	1
Rye	45	3	0	5
OTHER FIELD CROPS	4	2	0	2
Soybeans				-
Potatoes	14	2	0	2
Sugar beets				-
Field beans	52	0	0	0
HAY OR GRASS SILAGE	8278	9	0	-
PASTURED CROPLAND	5716	8	0	8
Cropland used for pasture	5544	6	0	
Improved pasture	172	2	0	2
VEGETABLES, SWEET CORN, MELONS				-
ORCHARDS	6	2	0	2
BERRIES	8	2	0	1 2
NURSERY & GREENHOUSE PRODUCTS				-
OTHER CROPS		-		210
Total Fertilizer Used, Tons		149	0	7/19
Percent of Fertilizer Used		100	0	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	200	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	38	1972	1615	Lo	1655
Total	238	Ton	mages for Oth	ner Recent Yes	TS
Primary Nutrients in Fertilizer	117	100			-
Nitrogen	38				
Phosphorus	37				
Potash	42				

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

21.3
24.6
28.3 1 Highways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Manure: Kind of	-			102
	Tons	of Materials i	in Wet Manure De	fecated
Livestock	Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2	145	1	0	1
Cattle: Table 3	54876	307	55	274
Sheep: Table 4	0			
Horses: Table 4	3169	22	3	19
Chickens: Table 5	514	8	2	2
Turkeys: Table 5	0			
Total from Livestock, Tons	58704	338	60	296
Fertilizers:	Tons of C	commercial Fer	tilizers Applie	4
			ry Nutrients	1 50 0 0 0 0
Item	Total	Nitrogen	Phosphorus	Potasi
Applied on Cropland: Table 7	238	38	37	42

To Convert From Pounds (1b)

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Superior 1.0 STATE: Michigan

PLANNING SUBAREA: East 1.2

COUNTY: Marquette

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS,	1972	
		He	rbi	cides	Inse	ect	icides		Ī

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn						
Grains	600	3.	200	2	0	
Hay or Grass Silage	1116	21	930	9	0	
Pastured Cropland	634	6	63h	6	0	
Other Field Crops	245	7	272	31	272	117
Vegetables	DESTRUCTION OF					
Orchards			Garage 1		and the same of	
Berries						
Nursery, Greenhouse						
Other Crops						
Totals Total Herbicides, In	2595	27	2036	0 1bs	272 14903	116

TABLE 2 MANUER FROM SUINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	hor	32	7	39
1969	368	27	29	56
1972	400	28	30	58

Wet Manure Factor: Tons per litter farrowed\_ Wet Manure Defecated: Tons, 1972\_ Nutrients in Wet Manure: Nitrogen, tons\_ 7.23 Phosphorus, tons Potash, tons

		Cows & Heifers	Heifers, Steers,
Year Total		Calved	Bulls, Calves
1964	21:32	1207	1225
1969	2229	1085	2714
1972	5/100	1200	1200
Wet Manure Fa	ctor: Tons	13.14	6.45
Wet Manure De Tons, 1972	fecated:	15768	7740

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	90	
1969	90 20	178
1972	20	769
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	32	9828
Nutrients in Wet Manure: Nitrogen, Tons	0	68
Phosphorus, Tons	0	10
Potash, Tons	0	59

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	6629		
1969	3229		
1972	3300		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	137	1 2	
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	2	-	
Phosphorus, tons Potash, tons	-	-	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres(1)	1169920	Number I-V farms 46 Acres in I-V farms 19788
Acres in farms	27393	Cropland I-V farms 7735
	10243	Harvested cropland
Harvested cropland in farms	5814	I-V farms 1/197

	Crop	Tons o	of Fertilizer	Used
Crops	Acres	Dry	Liquid	Total
CORN	243	35	0	35
GRAINS	1193	90	0	90
Wheat	1	68	0	68
Oats	1031	68	0	68
Barley				
Rye	160	23	0	23
OTHER FIELD CROPS	272	136	0	136
Soybeans				
Potatoes	272	136	0	136
Sugar beets				
Field beans	7	0	0	0
HAY OR GRASS SILAGE	2773	96	0	96
PASTURED CROPLAND	1.707	19	0	19
Cropland used for pasture	1675	19	0	19
Improved pasture	32	0	0	0
VEGETABLES, SWEET CORN, MELONS	5	1	0	1
ORCHARDS	25	18	0	18
BERRIES	1	0	0	0
NURSERY & GREENHOUSE PRODUCTS				
OTHER CROPS	3	0	0	0
Total Fertilizer Used, Tons		395	0	395
Percent of Fertilizer Used		100	0	0

TABLE 7-FERTILIZER	USED IN 1972	TABLE	APPLIED	MESTURE EQUIV	ALLENI
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	531	Year	Government Cost/Shared	Cost/Shared	Total Tonnage
Liquid	101	1972	711	0	711
Total	632			er Recent Yea	rs
Primary Nutrients in Fertilizer	310	401	anges 202 000		
Nitrogen	102				-
Phosphorus	99				
Potash	109				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	6514	39.8
1971-72	6527	h0.1
1972-73	5668	32.6
Total Estima As Comput	ited Tons Applied on All Hi	ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides		ecticides 8	Fungicides	Total 116
Table 1	27				
Manure: Ki	nd of			ls in Wet Manure I	
Livestoc		Manure		en Phosphorus	
Swine: Tab	Le 2	419	5	1	2
Cattle: Ta	ble 3	23508	132	24	118
Sheep: Tab		32	0	0	0
Horses: Table 4		9828	68	1.0	59
Chickens: Table 5		137	2	1	0
Turkeys: Table 5		0			
Total from Ton	Livestock,	33925	204	36	179
Fertilizers		Tons of	Commercial	Fertilizers Applie	d
Teresta			Pr	imary Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	632	102	99	109
	stone equival	ent purcha	sed or appl	ied, tons:	

To Convert From

Pounds (1b) Acres (scre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

# 4.3.2.3 Commercial Fertilizers

Currently a total of 3,665 metric tons (4,040 tons) of commercial fertilizers are applied to croplands in PSA 1.1, with primary nutrients representing 1,796 metric tons (1,980 tons) or 49 percent of the total. Nitrogen, phosphorus, and potash are almost equal in tonnages.

There are no factors suggesting major changes in crop production in the next 10 years. The greatest likelihood is that there may be a continuing decrease in agricultural activities. Fertilizer levels therefore are expected to remain constant, although the percent applied in liquid form may increase slightly.

#### 4.3.2.4 Lime

There were 7,018 metric tons (7,737 tons) of lime purchased or applied to croplands in PSA 1.2. This represents 24 percent of the total amount of limestone applied in the Lake Superior basin. Based on present usage rates, liming rates will remain relatively unchanged. Government cost-sharing programs, if operative, will not significantly affect the rates.

### 4.3.2.5 Salts

It is calculated that 42,357 metric tons (46,700 tons) of road de-icing salts are applied to all highways in PSA 1.2. This represents about 70 percent of all salts applied in the Lake Superior basin. The greater proportion of salts utilized reflects the larger amount of road mileage existing in this area as compared to PSA 1.1 and the increased utilization of this region in winter for recreational and tourist purposes. Road de-icing salts will increase in proportion to road mileage increases. There will be changes and improvements in usage; however, application rates are not likely to increase.

# Section 5

# MATERIALS USAGE IN THE LAKE MICHIGAN BASIN

### 5.1 Basin Characteristics

The Lake Michigan basin is comprised of 86 counties; 43 in Michigan, 27 in Wisconsin, 10 in Indiana, and 6 in Illinois. The counties have a total land area of 13,043,293 hectares (32,229,536 acres). The northern portion of the area (PSA's 2.1 and 2.4) is over 50 percent forested, with only relatively small, but significant, agricultural areas. In contrast, the southern portion of the area is largely cropland, with minor contributions from forest and pasture lands.

# 5.1.1 Agricultural Characteristics

The Lake Michigan basin ranks first in agricultural production accounting for about 45 percent of the land in farms in the entire Great Lakes Basin. Livestock production is important. Production levels are projected to remain fairly stable. Planning Subarea 2.1 is a particularly important agricultural area, ranking first in the Great Lakes Basin in the production of beef and dairy products. Related to these levels of livestock production are high levels of feed crop production. The basin produces substantial shares of other crops as well. Over half of the basin's fruit output is grown in this lake basin, primarily in Planning Subareas 2.3 and 2.4. Potato and commercial vegetable production are also significant, and this basin's share is expected to increase.

Table 5-1 indicates the relative proportions of materials usage in the Lake Michigan basin as compared to the total U.S. Great Lakes Basin.

Table 5-1

MATERIALS USAGE BASIN RELATIONSHIP--LAKE MICHIGAN 2.0 to GREAT LAKES

Per harvested acre of cropland	Lake Michiga	n basin Great 1	Lakes Basin
Lbs of chemicals applied Index of chemicals used	2.75 103	OND COMMON AND	2.66
Tons of livestock manure defecated Index of manure defecated	3.78 112	At 1.1, with ma.	3.37 100
Lbs primary nutrient in livestock Index primary nutrients in manure	manure 91		82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	26		321 22 100
Lbs primary nutrients in commerci Index primary nutrients in commerci	ial fertilizer 147 cial fertilizer 96		153 100
Lbs of lime applied Index of lime applied	183 107		170 100
Per acre of total land area Lbs road salts used Index road salts used	41.0 98	4	1.74
Tons (ton) Kilog Metri	To rams (kg) rams (kg) c Tons	Multiply By 0.454 907.2 0.907	Inem o Au ousq
5.1.2 Materials Usage			

# 5.1.2 Materials Usage

An inventory and analysis of materials usage was made based on personal interviews, correspondence and statistics as available from agricultural statistics, census information, state highway departments, universities, private companies, and state and federal agencies. (1) Background for the analysis is presented in a later section. Table 5-2 summarizes the findings of this inventory and analysis. Detailed statistics are shown in Table 5-3.

Table 5-2 MATERIALS USAGE (in 1972)

	Chemicals	3	Commercial	Limestone	Salts
	Applied	Livestock	Fertilizer	Purchased	Applied on
	to Crops	Manure	on Cropland	or Applied	all Highways
Area	(100 lbs)	) (tons)	(tons)	(tons)	(tons)
Lake Michigan basin	207,927	28,607,808	1,147,386	692,732	660,771
PSA 2.1	48,980	10,323,057	234,908	81,475	86,379
PSA 2.2	44,388	5,433,693	348,908	230,117	319,912
PSA 2.3	92,563	10,669,722	487,799	321,666	189,667
PSA 2.4	21,966	2,181,336	75,771	59,474	64,813
To Convert From		То	Mul	tiply By	
Pounds (1b)	Kilo	grams (kg)	0	.454	
Tons (ton)	Kilo	grams (kg)	907	. 2	
	Metr	ic Tons	0	.907	

# 5.1.2.1 Agricultural Chemicals

There was a total of 7,431,300 kilograms (20,792,660 pounds) of agricultural chemicals spread on agricultural lands in the Lake Michigan basin in 1972. Herbicides accounted for 58 percent, insecticides 26 percent, and fungicides 16 percent of the chemicals used. This amounts to 1.25 kilograms (2.75 pounds) of chemicals applied per acre of harvested cropland. Harvested cropland acres represent about 51 percent of all land in farms. Had the total chemical usage been equated in terms of all farmland, 6,001,200 hectares (14,828,769 acres), the rate would have been 0.64 kilograms (1.4 pounds) of chemicals applied per acre. Had it been equated in terms of the total land area, it would have amounted to 0.29 kilograms (0.65 pounds) of chemicals applied per acre.

Herbicide usage is expected to increase about 10 percent and fungicide usage about 5 percent in the next ten years in the basin as a whole. Most chemical authorities expect that insecticide usage may not be greater and perhaps even decrease in the next ten years. However, insecticide usage is expected to increase in the next five years but to decrease progressively after that.

One of the problems concerning the use of chemicals, even if effective in performing their functional roles, is that some residue will remain in the soils. In the case of herbicides, this is known as "carryover" and in the case of insecticides as "persistence." It is believed that the persistence associated with insecticides will be almost entirely eliminated in the future, and that carryover in herbicides will be greatly reduced, if not also eliminated.

#### 5.1.2.2 Animal Wastes

It is calculated that 25,947,280 metric tons (28,607,808 tons) of wet manure are produced annually. Of this amount 80 percent is produced from cattle, 9 percent from horses, 8 percent from swine, and the remaining 3 percent from other types of livestock. Nitrogen, phosphorous and potash combined comprise 1.2 percent of the total manure defecated. Total livestock numbers, and hence manure production levels, are not likely to decrease.

# 5.1.2.3 Commercial Fertilizers

A total of 1,040,909 metric tons (1,147,386 tons) of commercial fertilizers were applied to crops in the Lake Michigan basin in 1972. Primary nutrients of nitrogen, phosphorus and potash comprise 503,188 metric tons (554,783 tons) or 48 percent of the total tonnage. Nitrogen accounts for 33 percent, phosphorus 30 percent, and potash 37 percent of the primary nutrient content by weight.

Commercial fertilizer use may continue at about present levels. Farming will tend to be concentrated on fewer, but larger farms. Commercial fertilizer use on these larger farms will increase, as will the percent applied in liquid form. Overall, fertilizer rates will probably continue to increase modestly, with the greatest increase in nitrogen usage.

# 5.1.2.4 Lime

A total of 628,436 metric tons (692,732 tons) of limestone was used in the Lake Michigan basin in 1972. Lime is important in terms of its water quality impacts due to its effects on the pH level of water and subsequent

effects on water's acid-base relationships. The possibility of precipitating phosphorous in the water and altering calcium content are also likely.

The usage of lime is not likely to increase in the future in agricultural operations. This is partially predicated on the expectation that the federal government will not increase its lime cost-sharing agreements with farmers. Even if cost sharing agreement increase, it is not expected to significantly affect usage rates.

## 5.1.2.5 Salts

Because of severe climatic conditions during winter months and the resultant heavy snowfalls, road de-icing salts are required to keep major roadways open. It is calculated that 599,440 metric tons (660,771 tons) of salts were applied to highways in the Lake Michigan basin in the 1972-1973 winter. The primary impact upon ground and surface waters resulting from road de-icing salts comes from chloride discharges which can, over time, effect the salinity of nearby wells and open water areas. The 1972-1973 application would produce around 445,000 metric tons (490,000 tons) of chlorides. Assuming that chlorides are conservative and that ion exchange between chlorides and various soil types are minimal, most of the chlorides will eventually reach ground and surface water areas.

Road de-icing salts will likely increase in use in approximate proportion to road mileage increases. The so called bare-pavement policy will likely continue to be demanded by the public for major highways. This may be offset by slightly lower or less frequent applications on less traveled highways.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan, Wisconsin, Indiana, Illinois
Northwest 2.1, Southwest 2.2
(Michigan 43, Wisconsin 27,
PLANNING SUBAREA: Southeast 2.3, Northeast 2.4 COUNTY: 86 County Totals Indiana 10, Illinois 6)

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	2840525	78111.5	631227	9467.8		
Grains	718986	3592.0	239660	2394.3		
Hay or Grass Silage	648462	6482.9	540387	5401.2		
Pastured Cropland	331000	3306.1	331000	3306.1		
Other Field Crops	817936	17136.4	88741	5159.3		5786.2
Vegetables	225244	6332.6	209889	11911.1	208665	6569.6
Orchards	Contract of				11	2000
Berries	119811	5513.8	141628	17103.7	143557	20352.0
Nursery, Greenhouse						
Other Crops						
Totals	5701964	120475.3	2182532	54743.5	391469	32707.8
Total Herbicides, In					8275965	207926.6

TABLE 2-MANUER FROM SHINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1372470	153603	147093	300696
1969	1302830	130459	134053	264512
1972	1 344654	150514	154263	304777
	1 344654		arrowed (factor by	state only
	ure Defecated:			2231297
Nutrien	ts in Wet Manu	re: Nitrogen, t	ons	11157
		Phosphorus,	tons	3123
		Potash, ton	0	8473

	100000000000000000000000000000000000000	Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	2657809	1246985	1410824
1969	2314839	1056614	1258225
1972	2453888	1044751	1409137
Wet Manure Per Anim	Factor: Tons	13.14	6.45
Wet Manure Tons, 19	Defecated:	13728028	9088934
Wet Manure	Defecated: Tons, 1972	Combined: 2	2816962
Nutrients	in Wet Manure: Nitroge	en, tons	127775
	Phospho	orus, tons	22817
	Potash	tons	114085

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	278365	
1969	228690	65488
1972	188177	212129
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	302965	2711009
Nutrients in Wet Manure: Nitrogen,	Tons 4242	18706
Phosphore	is, Tons 636	2711
Potash 1	Tons 3030	16266

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	9733936		
1969	10273437		
1972	9655948	231920	2304260
Wet Manure Factor: Lbs. per bird	8.29	365.0	89.63
Wet Manure Defecated: Tons, 1972	400239		
Nutrients in Wet Manure: Nitrogen, tons	6244	Combined	144807 2259
Phosphorus, tons	1601		579
Potash, tons	1401		507

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	32229536	Number I-V farms	61646
Number of farms	94586	Acres in I-V farms	12127146
cres in farms	14828769	Cropland I-V farms	9276648
Cropland in farms	10783548	Harvested cropland	
larvested cropland in farms	7560723	I-V farms	6827499

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	2467343	308857	104699	413556
GRAINS	1254529	94632	4924	99556
Wheat	354543	38926	3448	42374
Oats	837040	51078	1339	52417
Barley	23733	2035	62	2097
Rye	24204	1344	41	1385
OTHER FIELD CROPS	870514	65097	7456	72553
Soybeans	721688	29282	3868	33150
Potatoes	46468	23250	2429	25679
Sugar beets				
Field beans	38569	212	50	232
HAY OR GRASS SILAGE	1810747	39187	950	40137
PASTURED CROPLAND	1159666	11915	514	12429
Cropland used for pasture	1050371	9881	477	10358
Improved pasture	109295	2034	37	2071
VEGETABLES, SWEET CORN, MELONS	231514	44887	3580	48467
ORCHARDS	183931	29232	1086	30318
BERRIES	15296	3418	56	3474
NURSERY & GREENHOUSE PRODUCTS	20637	6190	361	6551
OTHER CROPS	5773	351	22	373
Total Fertilizer Used, Tons		603978	123668	727646
Percent of Fertilizer Used		83	17	100

USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

TABLE 7-FERTILIZER	USED IN 1972
Item	Tons
Fertilizer Used on Crops: Solid	847349
Liquid	300037
Total	1147386
Primary Nutrients in Fertilizer	554783
Nitrogen	180438
Phosphorus	164377
Potash	209935

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
1972			692732

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	455578	
Total Est As Com	imated Tons Applied on All Hi puted 660771	ighways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicid	es	Inse 54743.	cticides 5	Fungicides 32707.8	Total 207926.6
HISTORIAL PROPERTY.	ind of		Tone	of Material	s in Wet Manure	Defecated
Manure: K: Livesto			Manure			
Swine: Tal		22	31297	11157	3123	8473
Cattle: T		22816962		127775	22817	114085
Sheep: Tal		302965		4242	636	3030
Horses: T		2711009		18706	2711	16266
Chickens:		1400239		6244	1601	1401
Turkeys:		1	45336	2259	579	507
	Livestock,	2860	7808	170383	31467	143762
Fertilizer	9:	1	ons of C	ommercial 1	Fertilizers Appli	ied
				Pri	mary Nutrients	
It	em	9	otal	Nitrogen	Phosphorus	Potast
Applied on Table 7	Cropland:	11	47386	180438	164377	209935

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

# 5.2 Planning Subarea 2.1

A total of 23 counties, including 20 in Wisconsin and 3 in Michigan, comprise Planning Subarea 2.1. The counties have a total land area of 3,989,800 hectares (9,858,656 acres). Farm land equals 1,772,500 hectares (4,379,800 acres), or 44 percent of the total land area. This subarea is particularly important in agricultural production, particularly in livestock production.

# 5.2.1 Agricultural Characteristics

Corn, oats, and hay or grass silage are the predominant crops in this planning subarea. Potatoes are important in Waushara and Lake County, Wisconsin, and 86 percent of the total orchard acreage in this planning subarea is in Door County, Wisconsin.

Table 5-4 indicates the relative proportions of materials usage in the planning subarea in comparison with the total Great Lakes Basin.

Table 5-4
MATERIALS USAGE BASIN RELATIONSHIP--PSA 2.1 TO GREAT LAKES

Per harvested acre of cropland	Planning Subarea 2.1 Great Lakes Basin
Lbs of chemicals applied Index of chemicals used	2.20 2.66 83 100
Tons of livestock manure defecated Index of manure defecated	4.64 3.37 138 100
Lbs primary nutrients in livestock man Index of primary nutrients in manure	108 82 132 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	211 321 19 22 66 100
Lbs primary nutrients in commercial fe Index primary nutrients in commercial f	
Lbs of lime applied Index of lime used	74 170 44 100
Per acre of total land area Lbs road salts used Index road salts used	16.5 41.74 40 100
To Convert From To Pounds (1b) Kilograms ( Tons (ton) Kilograms ( Metric Tons	

# 5.2.2 Materials Usage

The following table summarizes by county the material usage inventory for PSA 2.1. Tables 5-6 to 5-24 display the detailed statistics.

Table 5-5
MATERIALS USAGE
(in 1972)

	(111 17/2)				
PSA 2.1	Chemicals Applied to Crops (100 1bs)	Livestock Manure (tons)	Commercial Fertilizer on Cropland (tons)	Limestone Purchased or Applied (tons)	Salts Applied to all Highways (tons)
Michigan	150	10 001	- 000	001	
Dickinson	452	48,981	1,839	391	5,773
Iron	174	30,737	771	910	4,767
Menominee	323	228,570	4,035	351	2,587
Wisconsin					
Brown	2,540	847,952	11,376	3,322	5,954
Calumet	2,131	609,582	7,117	1,012	2,706
Door	3,003	346,595	6,990	335	2,548
Florence	128	38,772	885	689	2,737
Fond du Lac	7,252	1,148,132	32,677	7,272	8,363
Forest	120	49,230	691	1,756	4,595
Green Lake	2,230	412,231	11,963	3,783	1,498
Kewaunee	1,531	593,972	8,076	647	2,305
Langlade	2,951	254,828	11,795	9,751	3,511
Manitowoc	3,131	909,692	12,646	1,795	4,148
Marinette	1,110	296,463	6,226	2,090	4,370
Marquette	1,222	207,886	7,361	4,180	1,900
Menominee					
Oconto	2,385	600,923	14,401	2,076	4,564
Outagamie	3,778	982,197	25,014	4,753	3,272
Shawano	2,299	457,327	15,483	8,337	3,773
Sheboygan	3,101	727,760	10,863	2,580	6,316
Waupaca	2,539	723,786	15,841	8,556	3,070
Waushara	3,908	284,141	15,538	14,003	2,076
Winnebago	2,672	523,300	13,320	2,886	5,546
TOTAL	48,979	10,323,057	234,908	81,475	36,379
To Con	vert From	To		Multiply By	7
Pounds		Kilograms	(kg)	0.454	
Tons (		Kilograms	AND STATE OF THE S	907.2	
		Metric To	ns	0.907	

# 5.2.2.1 Agricultural Chemicals

There were 2,221,656 kilograms (4,897,940 pounds) of agricultural chemicals used in 1972. The major use was on crops of corn, hay or grass silage, and grain, with smaller amounts applied to pastured cropland and vegetables. Little is applied to fruit crops. Herbicides represented 53 percent of the total, insecticides 33 percent, and fungicides, 14 percent. Herbicide use may increase about 20 percent in the next 10 years and fungicide use about 10 percent. Insecticide use on grain and forage crops may increase 30-40 percent in the next 5 years, and then decrease to levels around present usage in 10 years.

### 5.2.2.2 Animal Wastes

Planning Subarea 2.1 ranks first in the Great Lakes in the production of beef and dairy products. There were 478,050 head of cows and heifers calved and 510,050 head of other types of cattle. In 1972, cattle accounted for 93 percent of the livestock manure produced and swine 5 percent. The total livestock manure produced in PSA 2.1 was 9,365,077 metric tons (10,323,057 tons). This represented 36 percent of the total manure produced in the Lake Michigan basin. Ninety-three percent of the manure in PSA 2.1 was produced by cattle, primarily dairy type.

Dairy cow numbers have declined about 20 percent and total cattle numbers 10 percent in the last 8 years. This decline is expected to continue, with manure production decreasing accordingly.

# 5.2.2.3 Commercial Fertilizers

There were 213,105 metric tons (234,908 tons) of commercial fertilizer applied to croplands in PSA 2.1 in 1972. Primary nutrients represented 110,636 metric tons (121,955 tons) or 52 percent of the total. Nitrogen comprised 26 percent, phosphorus 28 percent, and potash 46 percent of the total amount of primary nutrients applied in the Lake Michigan basin.

Because crop production rates are expected to change only slightly in the next 10 years, usage of commercial fertilizers will remain at about the same level or increase slightly. The percent applied in liquid form may increase slightly.

# 5.2.2.4 Lime

There were 73,913 metric tons (81,475 tons) of lime purchased or applied in PSA 2.1. This accounts for 12 percent of the total limestone purchased or applied in the Lake Michigan basin.

Liming amounts and rates will remain relatively unchanged. Government cost-sharing programs, if operative will not significantly affect the rates.

#### 5.2.2.5 Salts

There were 78,362 metric tons (86,379 tons) of road de-icing salts applied in PSA 2.1 in 1972-73 representing 13 percent of all road de-icing salts used in the Lake Michigan basin. The amounts of road de-icing salts may increase in proportion to increases in road mileage. However, increasing salt costs will limit expanded usage.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds
Michigan 3 Counties

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin 20 Counties

PLANNING SUBAREA: Northwest 2.1 COUNTY: Total 23 Counties

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres	Amount Used
Corn	596700	16408.2	132600	1988.9		
Grains	283702	1417.5	94566	944.7		
Hay or Grass Silage	315735	3157.2	263112	2630.4		
Pastured Cropland	114001	1138.9	114001	1138.9		
Other Field Crops	23406	607.9	16176	1798.7	15600	2339.9
Vegetables	128211	2801.2	128211	7171.0	128211	2874.7
Orchards	Mary Company	and the second				C Stoll No.
Berries	6681	329.6	7364	687.1	7463	1544.6
Nursery, Greenhouse						
Other Crops						
Totals	1468436	25860.5	756030	16359.7	151274	6759.2
Total Herbicides, In					237540	48979.4

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	279103	43471	41262	84733
1953	251645	34435	33799	68234
1972	224285	35160	36560	71720
Vet Manu	re Factor: T	ons per litter fa	arrowed	7.23
	re Defecated:			518536
Nutrient	s in Wet Manu	re: Nitrogen, to	ons	2593
		Phosphorus,	tons	726
		Potash, ton		1970

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	1080202	590417	489785
1969	959735	505910	453825
1972	988100	478050	510050
Wet Manure H Per Animal	actor: Tons	13.14	6.45
Wet Manure I Tons, 1972		6281577	3289823
	Defecated: Tons, 197		9571400 53600
TO THE MOST AND THE		horus, tons	9571
		h, tons	47857

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	24803	-
1969	18138	9828
1972	14980	11249
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	24118	143762
Nutrients in Wet Manure: Nitrogen, Tons	338	992 144
Phosphorus, Tons	51	
Potash, Tons	241	863

#### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		1542280		
1969		1133420	***	
1972		1483000	6000	60000
Wet Manure Factor	: Lbs. per bird	82.9	365.0	89.63
Wet Manure Defecat	ted: Tons, 1972	61470		
Nutrients in Wet Manure: Nitrogen, tons		959	Combined	3771 59
1	Phosphorus, tons	246		15
1	Potash, tons	215		13

## TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	9858656	Number I-V farms	20666
Number of farms	26891	Acres in I-V farms	3681087
Acres in farms	4379800	Cropland I-V farms	2677642
Cropland in farms	2996320	Harvested cropland	
Harvested cropland in farms	2226946	I-V farms	2070125

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	524688	62396	9087	71483
GRAINS	497291	26014	112	26126
Wheat	7905	408	4	412
Oats	478086	24937	98	25035
Barley	6384	478	. 8	486
Rye	3234	123	2	125
OTHER FIELD CROPS	30572	10486	168	10654
Soybeans	10344	609	8	617
Potatoes	16849	9141	160	9301
Sugar beets				
Field beans	10198	50	0	50
HAY OR GRASS SILAGE	898006	18787	138	18925
PASTURED CROPLAND	410980	2954	33	2987
Cropland used for pasture	386968	2785	.33	2818
Improved pasture	24012	169	0	169
VEGETABLES, SWEET CORN, MELONS	128321	17342	2001	19343
ORCHARDS	8712	1053	37	1090
BERRIES	429	104	5	109
NURSERY & GREENHOUSE PRODUCTS	1059	288	16	304
OTHER CROPS	562	64	0	64
Total Fertilizer Used, Tons		139538	11597	151135
Percent of Fertilizer Used		92%	8%	100%

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

TABLE /FERTILIZER USED IN 1972		LAUDIN	APPLIED	Indiana notati	
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	190478	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	44430	1972			81475
Total	234908		mages for Oth	or Popont Vac	
Primary Nutrients in Fertilizer	121955	100	mages for oth	ler Necent 1ea	10
Nitrogen	31936	-			_
Phosphorus	34278				
Potash	55741				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	59556	
Total Estim	ated Tons Applied on All H	ighways in 1972-73,

#### TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	as Insacticides		Fungicides	Total
Table 1	25860.5		16359.7	6759.2	48979.4
Manure: Kind of		Tons	of Material	s in Wet Manure D	efecated
Livestock		Manure	Nitroger	n Phosphorus	Potash
Swine: Table	2	518536	2593	726	1970
Cattle: Tabl	e 3	9571400	53600	9571	47857
Sheep: Table 4		24118	338	51	241
Horses: Tabl	e 4	143762	992	144	863
Chickens: Ta	able 5	61470	959	246	215
Turkeys: Tab	le 5	3771	59	15	13
Total from Livestock, Tons		10323057	58541	10753	51159
Fertilizers:		Tons of	Commercial Fe	ertilizers Applie	d
			Pri	mary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on Cr Table 7	ropland:	234908	31936	34278	55741

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To
Kilograms (kg)
Hectare (ha)
Kilograms (kg)

Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9\_\_\_

(1) County, land area, acres includes water areas under 40 acres in size.

86379

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin

PLANNING SUBAREA: Northwest 2.1 COUNTY: Brown

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMICALS	HERD	CONS	COUDE	1072

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used
Corn	35460	975.1	7880	118.2		
Grains	22933	114.6	7644	76.4		
Hay or Grass Silage	25320	253.2	21100	211.0		
Pastured Cropland	8309	83.0	8309	83.0		
Other Field Crops	85	2.1	52	5.7	50	7.5
Vegetables	5370	117,3	5370	300.3	5370	120.8
Orchards					2214	10000
Berries	193	10.7	209	20.0	212	41.2
Nursery, Greenhouse				2010	5, 1, 5,	7.1 +6
Other Crops						
Totals	97670	1556.0	50564	814.6	5632	169.5
Total Herbicides, In	secticide	s, Fungic	ides: 10	0 1bs	153866	

#### TABLE 2-MANURE FROM SWINE

Year	Inventory	D 1 M 21		
tear	Dec. 1	Spring	June 1-Nov. 30 Fall	Total
1964	10623	2148	2209	43.57
1969	9283	1799	1784	3 583
1972	8000	1500	1600	3100
		ons per litter fa	rrowed	7.23
Wet Manure 1				22413
Nutrients in	Wet Manur	e: Nitrogen, to	ons	112
		Phosphorus,		31
		Potash, tons		85

#### TABLE 3-MANURE FROM CATTLE

-		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	84968	46271	38697
1969	78476	40919	37557
1972	84500	39000	45500
Wet Manure Per Anima	Factor: Tons	13.14	6.45
Wet Manure Tons, 197		512460	293475
Wet Manure	Defecated: Tons, 19	72 Combined:	805935
Nutrients i	n Wet Manure: Nitro		4513
		phorus, tons	806
	Pota	sh, tons	4030

## TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	993	
1969	1369	649
1972	900	1200
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1449	15336
Nutrients in Wet Manure: Nitrogen, Tons	20	106
Phosphorus, Tons	3	15
Potash, Tons	14	92

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised	
1964	87961			
1969	48483			
1972	68000			
Wet Manure Factor: Lbs. per bird	82.9			
Wet Manure Defecated: Tons, 1972	2819			
Nutrients in Wet Manure: Nitrogen, tons	44	Combined		
Phosphorus, tons				
Potash, tons	10			

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	355552	Number I-V farms   1491
Number of farms	1886	Acres in I-V farms 230561
Acres in farms	255973	Cropland I-V farms   93082
Cropland in farms	210771	Harvested cropland
Harvested cropland in farms	163072	I-V farms   52848

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	32183	3568	647	4215
GRAINS	42158	1021	2	1023
Wheat	134	6	0	6
Oats	41779	1002	2	1004
Barley	209	13	0	13
Rye	33	0	0	0
OTHER FIELD CROPS	87	25	0	25
Soybeans				
Potatoes				
Sugar beets				
Field beans	159	0	0	0
HAY OR GRASS SILAGE	74813	956	5	961
PASTURED CROPLAND	30119	141	0	141
Cropland used for pasture	29148	130	0	130
Improved pasture	971	11	0	111
VEGETABLES, SWEET CORN, MELONS	5370	828	86	914
ORCHARDS	219	17	0	17
BERRIES	35	6	0	6
NURSERY & GREENHOUSE PRODUCTS	30	23	0	23
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		6585	740	7325
Percent of Fertilizer Used		90	10	100

#### TABLE 7--FERTILIZER USED IN 1972

TABLE /FERTILIZER	USED IN 1972	TABLE		MESTONE EQUIV	ALENT
Item	Tons		APPLIED	Tonnage not	
Fertilizer Used on Crops: Solid	9214	Year	Government Cost/Shared	Government	Total
Liquid	2162	1972			2222
Total	11376		F 011		3322
Primary Nutrients in Fertilizer	5916	lon	nages for Uth	er Recent Yea	rs
Nitrogen	1538	1			
Phosphorus	1656				
Potash	2722				

#### TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	4105	
Total Estima As Comput	ted Tons Applied on All Hi	ghways in 1972-73,

## TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides 1556.0		ticides 4.6	Fungicides	Total 2540.1
Manure: K		Tons o	f Materials	in Wet Manure De	fecated
Livesto		Manure	Nitrogen	Phosphorus	Potash
Swine: Tab		22413	112	31	85
Cattle: Ta		805935	4513	806	4030
Sheep: Tal	ole 4	1449	20	3	14
Horses: Ta		15336	106	15	92
Chickens:	Table 5	2819	44	11	10
Turkeys:	Table 5	***		222	
Total from Tor	Livestock,	847952	4795	866	4231
Fertilizers	11	Tons of Co		tilizers Applied	
				ry Nutrients	-
Ite	m	Total	Nitrogen	Phosphorus	Potash

		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	11376	1538	1656	2722
Lime: Limestone equiva	lent purcha	sed or applied	, tons:	3322

Lime: Limestone equivalent purchased or applied, tons:
Table 8

Salts: Applied on all highways, tons: Table 9

5954

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: Wisconsin PLANNING AREA: Lake Michigan 2.0 PLANNING SUBAREA: Northwest 2,1 COUNTY: Calumet

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	31170	873.6	7060	105.9		
Grains	15470	77.3	5157	51.5		
Hay or Grass Silage	17190	171.9	14325	143.2		
Pastured Cropland	4337	43.3	4337	43.3		
Other Field Crops	525	10.9	80	6.0	50	7.5
Vegetables	5713	124.8	5713	319.5	5713	128.5
Orchards						
Berries	61	2.9	68	6.2	68	14.3
Nursery, Greenhouse						
Other Crops						
Totals	75066	1304.7	36740	675.6	5831	150.3
Total Herbicides, In				0 1bs	117637	

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	-Total
1964	9046	1595	1588	3183
1969	6874	1265	1199	2464
1972	7000	1300	1400	2700
Wet Manu	re Factor: T	ons per litter f	arrowed	7,23
	re Defecated:			19521
Nutrient	s in Wet Manu	re: Nitrogen, t	ons	98
		Phosphorus,		27

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	57529	32321	25208		
1969	54868	30084	24784		
1972	57 500	31000	26500		
Wet Manure 1 Per Animal	actor: Tons	13.14	6.45		
Wet Manure I Tons, 1972		407340	170925		
Wet Manure I	Defecated: Tons, 1972	Combined:	578265		
Nutrients in Wet Manure: Nitroge			3238		
	Phosph	norus, tons	578		
		n, tons	2891		

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	478	
1969	217	3 56
1972	200	500
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	322	6390
Nutrients in Wet Manure: Nitrogen, Tons	5	44
Phosphorus, Tons	1/	6
Potash, Tons	3	38

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	64825		
1969	42524		
1972	62000	4000	40000
Wet Manure Factor: Lbs. per bir	d 82.9	365	89.63
Wet Manure Defecated: Tons, 197			1
Nutrients in Wet Manure:		Combined	2514
Nitrogen, tons	40		39
Phosphorus, ton	в 10		10
Potash, tons	9		9

TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

206336	Number I-V farms   1134
1331	Acres in I-V farms 172833
1.84730	Cropland I-V farms 141444
149977	Harvested cropland
s 122783	I-V farms 117079
	1331 184730 149977

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota.
CORN	27758	2693	375	3068
GRAINS	28564	330	0	330
Wheat	726	14	0	14
Oats	27085	298	0	298
Barley	636	1.8	0	18
Rye	80	0	0	0
OTHER FIELD CROPS	349	16	0	16
Soybeans	308	14	0	14
Potatoes	4	0	0	0
Sugar beets				
Field beans	398	0	0	0
HAY OR GRASS SILAGE	56 507	679	13	692
PASTURED CROPLAND	17040	23	0	23
Cropland used for pasture	16272	23	0	23
Improved pasture	768	0	0	0
VEGETABLES, SWEET CORN, MELONS	5713	439	14	453
ORCHARDS	82		0	1
BERRIES	2	0	0	0
NURSERY & GREENHOUSE PRODUCTS	3	0	0	0
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		4181	402	4583
Percent of Fertilizer Used		91	9	100

TABLE 7 PURTITION USED IN 1972 TARIE 8-CROIND LIMESTONE EQUIVALENT

TABLE 7FERTILIZER U	JSED IN 1972	TABLE	APPLIED	VIOVA ANOICAM	MARKETA
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	5765	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1352	1972			1012
Total	7117		magas for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	3701	101	mageo IVI VI	L CHO COLLEGE STATE	
Nitrogen	962	-			
Phosphorus	1036				
Potash	1703				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	1866	
Total Estima	sted Tons Applied on All Hi	ghways in 1972-73,

	Herbicides		secticides	Fungicides	Total 2130.6
Table 1	1304.7		575.6	150.3	Service Services of
Manure: Ki	nd of			ls in Wet Manure 1	
Livestoc	k	Manure			Potash
Swine: Tab	le 2	19521	98	27	74
Cattle: Ta	ble 3	578265	3238	578	2891
Sheep: Tab	le 4	322	5	- L	3
Horses: Ta		6390	44	6	38
Chickens:		2570	40	10	9
Turkeys: T		2514	39	10	9
Total from Ton	Livestock,	609582	3464	632	3024
Fertilizers		Tons of	Commercial	Fertilizers Applia	ed
			Pr	imary Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7		7117	962	1036	1703
Lime: Lime	stone equivale	ent purch	ased or appl	ied, tons:	1012

To Convert From Pounds (1b) Acres (acre) Tons (ton)

Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin PLANNING SUBAREA: Northwest 2.1 COUNTY: Door

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	8010	220.2	1.780	26.7		
Grains	18128	90.6	6043	60.4		
Hay or Grass Silage	13620	136.2	11350	113.5	Total Control	
Pastured Cropland	5331	53 - 3	5331	53 - 3		
Other Field Crops	180	5.4	200	23.0	200	30.0
Vegetables	764	16.7	764	42.7	764	17.2
Orchards						
Berries	5460	254.7	6070	558.7	6134	1300.3
Nursery, Greenhouse						
Other Crops						
W				000		
Totals	51493	777.1	31538	878.3	7098	1347.5
Total Herbicides, In	secticide	s, rungic	ides: 10	00 lbs	90129	3002.9

TABLE 2--MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
(ear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	4587	1036	1036	2072
1969	3679	714	757	1471
1972	3000	800	800	1600

Phosphorus, tons\_ Potash, tons\_

MARLE 2 MANIEUR PROM CATTER

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	37485	20340	17145			
1969	31672	16844	14828			
1972	34000	16300	17700			
Wet Manure Per Anima	Factor: Tons	13.14	6.45			
Wet Manure Defecated: Tons, 1972		214182	114165			
	Defecated: Tons, 1972		328347			
Nutrients i	n Wet Manure: Nitroge		1839			
		orus, tons	328			
	Potash,	tons	1642			

TARLE 4-MANUER FROM SHEEP AND HORSES

Year Item		Sheep & Lambs	Horses & Ponies
1964		134	
1969		144	376
1972		150	400
Wet Manure Factor: Tons per	animal	1.61	12.78
Wet Manure Defecated: Tons,	1972	242	5112
Nutrients in Wet Manure: Nit	rogen, Tons	3	3.5
Pho	sphorus, Tons		5
Pot	ash, Tons	2	31

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	37422		
1969	20170		
1972	32000		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	1326		
Nutrients in Wet Manure: Nitrogen, tons	21	Combined	
Phosphorus, tons	5		
Potash, tons	5	100	

TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	314560	Numbe	er I-V farms	909
Number of farms	1278		in I-V farms	149560
Acres in farms	177909	Cropl	and I-V farms	108383
Cropland in farms	126509	Harve	ested cropland	
Harvested cropland in farms_	90652		I-V farms	81.053
		Crop	Tons of Fert	ilizer Used

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota.
CORN	7433	865	25	890
GRAINS	28073	1516	0	1516
Wheat	628	46	0	46
Oats	27049	1455	0	1455
Barley	333	14	0	14
Rye	29	0	0	0
OTHER FIELD CROPS	239	114	0	114
Soybeans	20	3	0	3
Potatoes	218	109	0	109
Sugar beets				
Field beans	3 57	0	0	0
HAY OR GRASS SILAGE	37340	793	0	793
PASTURED CROPLAND	18324	113	0	113
Cropland used for pasture	17671	105	0	105
Improved pasture	653	8	0	8
VEGETABLES, SWEET CORN, MELONS	764	94	0	94
ORCHARDS	7486	836	35	871
BERRIES	70	23		24
NURSERY & GREENHOUSE PRODUCTS	155	86	0	86
OTHER CROPS	10	0	0	0
Total Fertilizer Used, Tons	The same	4440	61	4501
Percent of Fertilizer Used		99		100

TABLE 7FERTILIZER	USED IN 1972	TABLE 8GROUND LIMESTONE EQUIVALENT APPLIED					
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	5662	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	1328	1972			335		
Total	6990		Tonnages for Other Recent Years				
Primary Nutrients in Fertilizer	3635	101	mages for oth	NECELIC 160	1.0		
Nitrogen	945						
Phosphorus	1018						
Potash	1672						

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	1757	
Total Est As Cor	imated Tons Applied on All H	ighways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	In	secticides	Fungicides	Total
Table 1	777.1		878.3	1347.5	3002.9
Manure: Ki	nd of	Ton	s of Material	s in Wet Manure D	efecated
Livestock		Manur	Nitroge	n Phosphorus	Potash
Swine: Tab	Le 2	11568	58	16	44
Cattle: Tal	ole 3	328347	1839	328	1642
Sheep: Tab	le 4	242	3		2
Horses: Tal	ole 4	5112	35	5	31
Chickens: '	Table 5	1326	21	5	5
Turkeys: Ta	able 5				in min
Total from I		346595	1956	355	1724
Fertilizers		Tons of	Commercial I	Fertilizers Applie	d
				mary Nutrients	
Ite	n	Total	Nitrogen	Phosphorus	Potasi
Applied on Table 7	Cropland:	6990	945	1018	1672
Lime: Lime: Table	stone equivale	ent purch	ased or appli	led, tons:	335

To Convert From

To Pounds (1b) Acres (acre) Tons (ton) Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures,	Fertilizers.	Lime	and	Highway	De-Icing	Compounds
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STATE: Wisconsin PLANNING AREA: Lake Michigan 2.0 PLANNING SUBAREA: Northwest 2.1 COUNTY: Florence

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	540	14.8	120	1.8		
Grains	544	2.7	181	1.8		
Hay or Grass Silage	1710	17.1	1425	14.2		
Pastured Cropland	859	8.5	859	8.5		
Other Field Crops	180	5.4	200	23.0	200	30.0
Vegetables	3	.1.	3	.2	3	
Orchards						
Berries	0	0	0	0	0	0
Nursery, Greenhouse						
Other Crops						
Totals	3836	48.6	2788	49.5	203	30.1
Total Herbicides, In	secticide	s, Fungio	ides: 10	0 lbs	6827	128.2

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	61	8	0	8
1969	213	16	63	79
1972	1000	100	100	200
	e Factor: To	ons per litter f	arrowed	7.23
		re: Nitrogen, to	ons	7
	The same of the sa			2
MULLICHES		Phosphorus,	tons	4

### TABLE 3-MANURE FROM CATTLE

		Number Cattle	Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	4158	2089	2069				
1969	3331	1438	1893				
1972	3700	1200	2500				
Wet Manure I Per Animal	actor: Tons	13.14	6.45				
Wet Manure I Tons, 1972		15768	16125				
Wet Manure I	Defecated: Tons, 19	72 Combined:	31893				
Nutrients in	Wet Manure: Nitre	ogen, tons	179				
	Phos	phorus, tons	32				
		sh, tons	159				

### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	43	
1969	0	74
1972	45	400
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	72	5112
Nutrients in Wet Manure: Nitrogen, Tons		35
Phosphorus, Tons	0	5
Potash, Tons		31

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	6263		
1969	3683		
1972	6000		
Wet Manure Factor: Lbs. pe	r bird 82.9		
wet Manure Defecated: Tons	, 1972 249		
Nutrients in Wet Manure: Nitrogen,	tons 4	Combined	
Phosphorus Potash, to	tons		

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	311936	Number I-V farms	68
Number of farms	104	Acres in I-V farms	21753
Acres in farms	27903	Cropland I-V farms	9637
Cropland in farms	13261	Harvested cropland	
Harvested cropland in farms	8522	I-V farms	5738

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	466	65	0	65
GRAINS	1033	118	2	120
Wheat	1.4	2	.0	2
Oats	876	107	2	109
Barley	33	3	. 0	3
Rye	110	6	0	6
OTHER FIELD CROPS	437	287	0	287
Soybeans				
Potatoes	437	287	0	287
Sugar beets				
Field beans				
HAY OR GRASS SILAGE	3816	78	0	78
PASTURED CROPLAND	3386	19	0	19
Cropland used for pasture	3015	13	0	13
Improved pasture	371	6	0	- 6
VEGETABLES, SWEET CORN, MELONS	3	1	0	1
ORCHARDS	0	0	0	0
BERRIES	0			
NURSERY & GREENHOUSE PRODUCTS	0			
OTHER CROPS	0			
Total Fertilizer Used, Tons		568	2	570
Percent of Fertilizer Used		100	0)	100

TABLE 7-FERTILIZER U	SED IN 1972	TABLE		MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	717	Year	Government Cost/Shared	Government Cost/Shared	Total
Liquid	168	1972			689
Total	885		nagge for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	460	100	nages for our	er necent rea	100
Nitrogen	120				_
Phosphorus	129				
Potash	211				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	1887	
Total Est	imated Tons Applied on All Hi	ghways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Inse	cticides	Fungicides	Total
Table 1	48.6	49.5		30.1	128.2
Manure: B	and of	Tons of Materials		s in Wet Manure 1	Defecated
Livesto		Manure	Nitroge	en Phosphorus	Potash
Swine: Ta	ble 2	1446	7	2	5
Cattle: 7		31893	179	32	1.59
Sheep: Table 4		72		0	
Horses: Table 4		5112	3.5	5	3.1
Chickens: Table 5		249	4		
Turkeys: Table 5					
Total from Livestock, Tons		38772	226	40	197
Fertilizer	rs:	Tons of C	commercial 1	Fertilizers Applie	ed
*CILILIE			Pri	Imary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied or Table 7	Cropland:	885	120	129	211
	mestone equiva	lent purchas	ed or appli	ied, tons:	689
Tal					68

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin

PLANNING SUBAREA: Northwest 2.1 COUNTY: Fond du Lac

TABLE 1 PETIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	18180	2249.7	18180	272.7		
Grains	30517	152.5	10172	101.7		
Hay or Grass Silage	25740	257.4	21450	214.5		
Pastured Cropland	8861	88.6	8861	88.6		
Other Field Crops	1610	33.1	195	12.4	100	15.0
Vegetables	37092	810.5	37092	2074.6	37092	834.6
Orchards	- NAME OF THE	-				
Berries	128	8.5	133	13.6	138	23.9
Nursery, Greenhouse						
Other Crops						
Totals	185758	3600.3	96083	2778.1	37330	873.5
Total Herbicides, In				00 lbs	319171	7251.9

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	56537	6648	6279	12927
1969	58673	593 5	6125	12060
1972	52000	6000	6300	12300
		ons per litter f.	arrowed	7.23
	re Defecated:		000	88929 445
utrient	s in wet Manu	re: Nitrogen, to Phosphorus.		125
		Potash, ton		338

TARTE 2 MANITED FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	108715	58972	49743			
1969	98377	51484	46893			
1972	10800	49800	58200			
Wet Manure Per Animal		13.14	6.45			
Wet Manure I		654372	375390			
Wet Manure 1	Defecated: Tons, 1972	Combined:	1029762			
	Wet Manure: Nitroge		5767			
		orus, tons	1030			
		. tons	5149			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	3013	
1969	2260	740
1972	2200	1300
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	3 542	16614
Nutrients in Wet Manure: Nitrogen, Tons	50	115
Phosphorus, Tons	7	17
Potash, Tons	35	100

TABLE 5-MANURE FROM CHICKENS & THREEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		196295		
1969		175214		
1972		224000		
Wet Manure Facto	or: Lbs. per bird	82.9		
Wet Manure Defe	cated: Tons, 1972	9285		
Nutrients in Wes	Manure: Nitrogen, tons	145	Combined	
	Phosphorus, tons	37		
	Potash, tons	32		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 463872	Number I-V farms	2050
Number of farms	2429	Acres in I-V farms	262270
Acres in farms	386913	Cropland I-V farms_	297552
Cropland in farms	312943	Harvested cropland	
Harvested cropland in fa	rms 254556	I-V farms_	246712

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	80907	9778	1729	11507
GRAINS	55290	2193	24	2217
Wheat	576	23	2	25
Oats	53000	2087	18	2105
Barley	1331	70	5	75
Rye	26		0	
OTHER FIELD CROPS	2279	133	0	133
Soybeans	1914	67	0	67
Potatoes	31	24	0	24
Sugar beets				
Field beans	754	9	0	9
HAY OR GRASS SILAGE	73478	1719	10	1729
PASTURED CROPLAND	35075	143	8	151
Cropland used for pasture	32797	139	8	147
Improved pasture	2278	4	0	14
VEGETABLES, SWEET CORN, MELONS	37092	4227	1035	5262
ORCHARDS	110	6.	0	6
BERRIES	49	13	0	13
NURSERY & GREENHOUSE PRODUCTS	22	6	0	6
OTHER CROPS	87	8	0	8
Total Fertilizer Used, Tons		18235	2806	21041
Percent of Fertilizer Used		87	13	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

IRDLE / FERT HILLIAM	20000 000 000		APPLIED	AND CONTRACTOR OF THE PARTY OF	national control
Item	Tons		Tonnage	Tonnage not	THE STATE OF THE STATE OF
Fertilizer Used on Crops: Solid	26468	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	6209	1972			7272
Total	32677	Ton	naces for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	16992	100	linges for our		
Nitrogen	4418				
Phosphorus	4758				
Potash	7816				

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	5766	
Total Estima As Comput	ted Tons Applied on All	Highways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides		cticides	Fungicides	Total
Table 1	3600.3	277	8.1	873.5	7251.9
Manure: Kind	of	Tons	of Materials	s in Wet Manure D	efecated
Livestock	15517	Manure	Nitroger	Phosphorus	Potasi
Swine: Table	2	88929	445	125	338
Cattle: Table		1029762	5767	1030	5149
Sheep: Table		3542	50	7	35
Horses: Table 4		16614	115	17	100
Chickens: Ta		9285	145	37	32
Turkeys: Tab		***			
Total from Livestock, Tons		1148132	6522	1216	5654
Fertilizers:		Tons of C	ommercial Fe	ertilizers Applie	d
			Pri	mary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potas
Applied on Cropland: Table 7		32677	4418	4758	7816
Lime: Limest Table		nt purchas	ed or appli	ed, tons:	7272
Salts: Appli		egoverner our			8363

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING SUBAREA: Northwest 2.1 COUNTY: Forest

Herbi	cides	Insect	icides	Fungicides	
Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
225	6.1	50	.7		
997	4.9	332	3.3		
2970	29.7	2475	24.7		
1753	17.5	1753	17.5		
45	1.3	50	5.7	50	7.5
2	0	2	alo.	2	0
1	-1	2	SI.	2	+3
5993	59.6	4664	52.1	54	7.8
	Acres Treated 225 997 2970 1753 45 2	Acres Treated 100 1bs  225 6.1 997 4.9 2270 29.7 1753 17.5 45 1.3 2 0	Acres Used Treated 100 lbs Treated 225 6.1 50 997 4.9 332 2970 29.7 2475 1753 17.5 17.5 17.5 17.5 1.3 50 2 0 2	Acres Used 100 lbs Treated 100 lbs 1225 6.1 50 .7. 997 4.9 332 3.3 2970 29.7 2475 24.7. 1753 17.5 17.53 17.5 17.5 17.5 2 0 2 .1	Acres Treated 100 lbs Treated 100 lbs Treated 225 6.1 50 .7 7 997 4.9 332 3.3 2970 29.7 24.75 17.55 17.53 17.5 17.53 17.5 1.3 50 5.7 50 2 .1 2

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sov	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	101	12	9	2-1
1969	113	6	12	18
1972	500	50	50	100
		ons per litter f.	arrowed	7.23
	re Defecated:			723
Nutrient	s in Wet Manu	re: Nitrogen, to	ons	4
		Phosphorus,	tons	1

TABLE 3--MANURE FROM CATTLE

		Number Cattle and Calves			
Year Total		Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	5813	3161	2652		
1969 1972	46 52 5000	1900	2375 3100		
Wet Manure F Per Animal	Pactor: Tons	13.14	6.45		
Wet Manure I Tons, 1972		24966	19995		
	Defecated: Tons, 197		44961		
Nutrients in	Wet Manure: Nitro	ogen, tons	252 45		
		sh, tons	225		

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	205	
1969	12	286
1972	100	200
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2	18
Nutrients in Wet Manure: Nitrogen, Tons	0	3
Phosphorus, Tons	2	1.5
Potash Tone		

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		6996		
1969		13594		
1972		20000		
Wet Manure Factor:	Lbs. per bird	82.9		
wet Manure Defecat	ed: Tone 1972	829		
Nutrients in Wet M	anure: itrogen, tons	13	Combined	
P	hosphorus, tons	3		
P	otash, tons	3		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	644736	Number I-V farms	103
Number of farms	158	Acres in I-V farms	3.8479
Acres in farms	48543	Cropland I-V farms	12689
Cropland in farms	16081	Harvested cropland	
Harvested cropland in farms	8054	I-V farms	6785

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	177	30	0	30
GRAINS	1426	197	5	202
Wheat	0	0	0	0
Oats	1328	188	4	1.92
Barley	6	0		
Rye			4 -	
OTHER FIELD CROPS	128	63	0	63
Soybeans				
Potatoes	128	63	0	63
Sugar beets				
Field beans	144	0	0	0
HAY OR GRASS SILAGE	5049	142	0	142
PASTURED CROPLAND	5861	8	0	8
Cropland used for pasture	5493	7	0	7
Improved pasture	368		0	T Y
VEGETABLES, SWEET CORN, MELONS	2	0	0	0
ORCHARDS	2	0	0	0
BERRIES	0	0	0	0
NURSERY & GREENHOUSE PRODUCTS	0	0	0	0
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		440	5	445
Percent of Fertilizer Used		99		100

TABLE 7FERTILIZER	USED IN 1972	TABLE	APPLIED	MESTONE EQUIV	ALENI
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	560	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	131	1972			1756
Total	691		nages for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	359	101	10800 101 01	100000	
Nitrogen	93				-
Phosphorus	101				
Potash	165				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	3168	
Total Estima As Comput	ted Tons Applied on All Hi	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	secticides	Fungicides	Total
Table 1	59.6		52.1	7.8	119.5
Manure: K	ind of	Tons	of Material	s in Wet Manure D	efecated
Livesto	ck	Manure	Nitroge	n Phosphorus	Potash
Swine: Tal		723	- 4		3
Cattle: T		44961	2.52	45	225
Sheep: Tal		161	2	0	2
Horses: T.		2556	18	3	15
Chickens:	Table 5	829	13	3	3
Turkeys: '	Table 5				
Total from Tot	Livestock,	49230	289	52	248
Fertilizer	s:	Tons of	Commercial F	ertilizers Applie	d
			Pri	mary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	691	93	101	165

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9\_

(1) County, land area, acres includes water areas under 40 acres in size.

4595

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin

PLANNING SUBAREA: Northwest 2.1 COUNTY: Green Lake

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	36900	1014.7	8200	123.0		
Grains	8098	40.4	2699	26.9		-
Hay or Grass Silage	8190	81.9	6825	68.2		
Pastured Cropland	2762	27.6	2762	27.6		
Other Field Crops	445	9.3	75	5.9	50	7.5
Vegetables	7763	169.6	7763	434.2	7763	174.7
Orchards		10000000				1,000
Berries	58	5.7	52	6.5	58	5.8
Nursery, Greenhouse						-
Other Crops						
Totals	64216	1349.2	28376	692.3	7871	188.0
Total Herbicides, In	secticide	s, Fungio	ides: 10	0 lbs	100463	

TABLE 2-MANITER FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	30754	3406	3073	6479
1969	32767	3109	2749	5858
1972	27500	3000	3100	6100
et Manu	re Factor: To	ons per litter fa	arrowed	7.23
et Manu	re Defecated:	Tons, 1972		44103
Jutrients	in Wet Manus	re: Nitrogen, to	ons	221
		Phosphorus,	tons	62
		Potash, tons	2	168

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	37781	17497	20284 -		
1969	37081	16608	20473		
1972	39500	14600	24900		
Wet Manure Per Anima	Factor: Tons	13.14	6.45		
Wet Manure Tons, 197		191844	160605		
	Defecated: Tons, 197 n Wet Manure: Nitro		3,52449 1974		
merasuro 1		horus, tons	352		
	Potas	h, tons	1762		

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	3955	
1969	2521	260
1972	2500	500
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	4025	6390
Nutrients in Wet Manure: Nitrogen, Tons	56	44
Phosphorus, Tons	8	6
Potash, Tons	40	38

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		102945		
1969		96531		
1972		127000		
Wet Manure Factor:	Lbs. per bird	82.9		
Wet Manure Defecated	i: Tons, 1972	5264		
	trogen, tons	82	Combined	
	esphorus, tons	18	_	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	226816	Number I-V farms 715
Number of farms	877	Acres in I-V farms   53394
Acres in farms	169423	Cropland I-V farms   11641
Cropland in farms	122104	Harvested cropland
Harvested cropland in farms	94588	I-V farms 88811

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	38440	4213	838	5051
GRAINS	16864	776	2	778
Wheat	162	2	0	2
Oats	16203	741	2	743
Barley	327	15	0	15
Rye	95	5	0	5
OTHER FIELD CROPS	591	103		104
Soybeans	481	36		37
Potatoes	109	65	0	65
Sugar beets				
Field beans	601	1 1	0	1
HAY OR GRASS SILAGE	25677	510	32	542
PASTURED CROPLAND	12046	42	3	45
Cropland used for pasture	10460	40	3	43
Improved pasture	1586	2	0	2
VEGETABLES, SWEET CORN, MELONS	7763	1020	150	1170
ORCHARDS		0	0	0
BERRIES	57	12	0	12
NURSERY & GREENHOUSE PRODUCTS	0	0	0	0
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		6677	1026	7703
Percent of Fertilizer Used		87	13	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

Item	Tons	
Fertilizer Used on Crops: Solid	9690	
Liquid	2273	
Total	11963	
Primary Nutrients in Fertilizer	6221	
Nitrogen	1617	
Phosphorus	1742	
Potash	2862	

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
1972			3783
Ton	mages for Oth	er Recent Yea	rs

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Tons Applied Per Through State "E" Mile
1970-71	
1971-72	
1972-73	1033
	rimated Tons Applied on All Highways in 1972-73,

D-1-1- 1	Herbicides		cticides	Fungicides	Total
Table 1	1349.2	69	2.3	188.0	2229.5
Manure: Ki	ind of	Tons	of Material	ls in Wet Manure D	efecated
Livesto	ck	Manure	Nitroge	en Phosphorus	Potash
Swine: Tab	ole 2	44103	221	62	168
Cattle: Ta	able 3	3 52449	1974	3 52	1762
Sheep: Tab	le 4	4025	56 44	8	40
Horses: Ta		6390	1414	8	3.8
Chickens:	Table 5	5264	82	21	18
Turkeys: T	Table 5				227
Total from Ton		412231	2377	449	2026
Fertilizers	1.1	Tons of (	Commercial 1	Fertilizers Applie	d
			Pri	imary Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	11963	1617	1742	2862
Lime: Lime Tabl	stone equivale	ent purchas	sed or appli	ied, tons:	3783

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING	AREA:	Lake Michigan	2.0	STATE:	Wisconsin
PLANNING	SUBAREA:	Northwest	2.1	COUNTY:	Kewaunee

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972

Herbi	cides	Insecticides		Fungicides	
Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
18990	522.2	4220	63.3		
19760	98.7	6586	65.8		
18150	181.5	15125	151.2		
6342	63.4	6342	63.4		
85	2.1	52	5.7	50	7.5
2673	58.4	2673		2673	60.1
97	4.5	109	9.9	109	23.3
66097	930.8	35107	508.8	2832	90.9
	Acres Treated 18990 19760 18150 6342 85 2673	Acres Used 100 lbs 18990 522.7 19760 98.7 18150 181.5 6342 63.4 85 2.1 2673 58.4 97 4.5	Acres Treated 100 1bs Treated 18990 522.2 4220 19760 98.7 6586 18150 181.5 15125 6342 6342 85 2.1 52 2673 58.4 2673 97 4.5 109	Acres Treated 100 lbs Treated 100 lbs 18990 522.2 4220 63.3 19760 98.7 6586 65.8 18150 181.5 15125 151.2 6342 63.4 6342 63.4 85 2.1 52 5.7 2673 58.4 2673 149.5 97 4.5 109 9.9	Acres Treated 100 lbs Treated

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sov		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	9247	2307	2169	4476
1969	9140	1725	.1792	3517
1972	8500	2000	2100	4100
Wet Manu	re Factor: T	ons per litter fa	arrowed	7.23
	re Defecated:		2000	29643
Nutrient	s in Wet Manu	re: Nitrogen, to	ons	148
		Phosphorus,	tons	42
		Potash, tons		113

#### TABLE 3--MANURE FROM CATTLE

	The State of the Land of the L	Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	54142	31513	22629		
1969	51681	29616	22065		
1972	55000	30400	24600		
Wet Manure I Per Animal	actor: Tons	13.14	6.45		
Wet Manure I Tons, 1972		399456	158670		
Wet Manure I	efecated: Tons, 1972	Combined:	558126		
	Wet Manure: Nitroge		3126		
	Phosph	orus, tons	558		
	Potash	, tons	2791		

#### TABLE 4---MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	404	
1969	215	267
1972	210	300
Wet Manure Factor: Tons per animal	1.61	12,78
Wet Manure Defecated: Tons, 1972	338	3834
Nutrients in Wet Manure: Nitrogen, Tons	5	26
Phosphorus, Tons		4
Potash, Tons	3	23

#### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year It	em	Chickens	Turkey Hens	Turkeys Raised
1964		54912		
1969	-	33308		
1972		49000		
Wet Manure Factor: Lbs.	per bird	82.9		
wet Manure Defecated: To	ns, 1972	2031		
Nutrients in Wet Manure:			Combined	
Nitrogen	, tons	32		
	us, tons	8		
Potash,	tons	7		the second

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 2110		ber I-V fa			
Number of farms 1378			farms 17557		
			farms 14029	90	
Cropland in farms 1513		vested cro			
Harvested cropland in farms 1172	290				
	Crop	Tons o	of Fertilizer	Used	
Crops	Acres	Dry	Liquid	Tota	
CORN	16612	1895	249	2144	
GRAINS	3 5 8 6 7	1456	9	1465	
Wheat	366	17	0	17	
Oats	34947	1405	9	1414	
Barley	436	27	0	27	
Rye	8	0	0	0	
OTHER FIELD CROPS	80	19	0	19	
Soybeans					
Potatoes	24	9	0	9	
Sugar beets					
Field beans	264	0	0	0	
HAY OR GRASS SILAGE	57097	1027	9	1036	
PASTURED CROPLAND	23688	177	0	177	
Cropland used for pasture	23001	175	0	175	
Improved pasture	687	2	0	2	
VEGETABLES, SWEET CORN, MELONS	2673	322	11	333	
ORCHARDS	135	25		26	
BERRIES	0	0	0	0	
NURSERY & GREENHOUSE PRODUCTS	0	0	0	0	
OTHER CROPS	0	0	0	0	
Total Fertilizer Used, Tons		4921	279	5200	
Percent of Fertilizer Used		95	5	100	

TABLE 7FERTILIZER U	SED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	6541	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	153.5	1972			647
Total Primary Nutrients in Fertilizer	8076 4200		nages for Oth	er Recent Yea	
Nitrogen	1092				
Phosphorus	1176				
Potash	1932				

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
970-71		
971-72		
972-73	1 589	

#### TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides 930.8	-	nsecticides Fungicide 508.8 90.9		Total   1530.5
Manure: Kit	nd of	Tons	of Material	Is in Wet Manure D	efecated
Livestoc		Manure	Nitroge	en Phosphorus	Potash
Swine: Tabl	Le 2	29643	148	42	113
Cattle: Tab	ole 3	558126	3126	558	2791
Sheep: Tab		338	5		3
Horses: Tak		3834	26	4	23
Chickens: Table 5		2031	32	8	7
Turkeys: Table 5		FRE		# # W	***
Total from I	livestock,	593972	3337	613	2937
Fertilizers		Tons of G	ommercial I	Fertilizers Applie	ď
		Contract of the		mary Nutrients	
Iter	n	Total	Nitrogen	Phosphorus	Potash
Applied on (	Cropland:	8076	1092	1176	1932
Lime: Lime: Table	stone equivales 8	nt purchase	ed or appli	Led, tons:	647
	lied on all hi	ahwaye to	ne: Tahla	9	2305

To Convert From Pounds (1b) Acres (acre) Tons (ton)

Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin

PLANNING SUBAREA: Northwest 2.1 COUNTY: Langlade

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	3645	100.2	810	12.1		
Grains	8248	41.2	2749	27.4		
Hay or Grass Silage	9840	98.4	8200	82.0		
Pastured Cropland	4019	40.1	4019	40.1		
Other Field Crops	7195	215.4	7952	914.2	7950	1192.5
Vegetables	1798	39.3	1798	100.6	1798	40.5
Orchards		1000				
Berries	18	.8	20	1.8	20	4.3
Nursery, Greenhouse						
Other Crops						
Totals	34763	535.4	25548	1178.2	9768	1237.3
Total Herbicides, In					70079	2950.9

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	. 898	206	160	366
1969	632	92	102	194
1972	1000	150	150	300
Wet Manu	re Factor: T	ons per litter f	arrowed	7.23
Wet Manu	re Defecated:	Tons, 1972		2169
Nutrient	s in Wet Manu	re: Nitrogen, t	ons	11
		Phosphorus,	tons	3
		Potash, ton		R.

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	27904	16075	11829		
1969	22297	12724	9573		
1972	24500	13100	11400		
Wet Manure Per Animal	Pactor: Tons	13,14	6.45		
Wet Manure I Tons, 1972		172134	73 53 0		
	Defecated: Tons, 1972		245664		
Nutrients in	Wet Manure: Nitroge		1376		
		rus, tons	246		
	Potash,	tons	1228		

### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	477	
1969	766	404
1972	500	400
Wet Manure Factor: Tons per animal	1,61	12,78
Wet Manure Defecated: Tons, 1972	805	5112
Nutrients in Wet Manure: Nitrogen, Tons	11	35
Phosphorus, Tons	2	5
Potash, Tons	8	31

#### TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	34803		
1969	18556		
1972	26000	122	-44
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	1078		
Nutrients in Wet Manure: Nitrogen, tons	17	Combined	
Phosphorus, tons	4		
Potash, tons	4		

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

(1) -1.000

COUNTY, land area, acres         5480           Number of farms         748           Acres in farms         1633           Cropland in farms         850           Harvested cropland in farms         5916	Acr 526 Cro 50 Har	ber I-V fa es in I-V pland I-V vested cro I-V	farms 1403 farms 7686	6
	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	3262	504	15	519
GRAINS	16568	1149	2	1151
Wheat	56	6	0	6
Oats	16346	1139	0	1139
Barley	74	4	2	6
Rye	53	0	.0	0
OTHER FIELD CROPS	9314	4808	23	4831
	The state of the s			A CONTRACTOR

CORM	3202	204	1.2	219
GRAINS	16568	1149	2	1151
Wheat	56	6	0	6
Oats	16346	1139	0	1139
Barley	74	4	2	6
Rye	53	0	.0	0
OTHER FIELD CROPS	9314	4808	23	4831
Soybeans	0	0	0	0
Potatoes	9289	4806	23	4829
Sugar beets				
Field beans	508	. 0	0	0
HAY OR GRASS SILAGE	24549	534	13	547
PASTURED CROPLAND	14694	346	0	346
Cropland used for pasture	13571	335	0	335
Improved pasture	1123	1.1	0	11
VEGETABLES, SWEET CORN, MELONS	1798	196	0	196
ORCHARDS	25	3	0	3
BERRIES	0	0	0	0
NURSERY & GREENHOUSE PRODUCTS	12	2	0	2
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		7542	53	7595
Percent of Fertilizer Used		99	1	100

TABLE 7-FERTILIZER	USED IN 1972	TABLE	8-GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	9554	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	2241	1972			9751
Total.	11795		Con Oak	Devent Ven	
Primary Nutrients in		100	nages for Uti	er Recent Yea	rs
Fertilizer	6133	-			
Nitrogen	1595	_			
Phosphorus	1717				
Potash	2821				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		THE RESIDENCE LINE
1971-72		
1972-73	2421	
Total Esti	mated Tons Applied on All H	ighways in 1972-73,

Table 1	Herbicides 535,4	Inse	cticides 3,2	Fungicides	Total 2950.9
Manure: Ki	nd of	Tons	of Materials i	in Wet Manure De	
Livestoc	k	Manure	Nitrogen		Potash
Swine: Tab	le 2	2169	110	3	8
Cattle: Ta	ble 3	245664	1376	246	1228
Sheep: Tab	le 4	805	11	2	8
Horses: Ta	ble 4	5112	35	5	31
Chickens:	Table 5	1078	17	14	4
Turkeys: T	able 5		(***		
Total from Ton		254828	1450	260	1279
Fertilizers		Tons of C	ommercial Fert	ilizers Applie	1
			Primar	ry Nutrients	-
Ite		Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	11795	1595	1717	2821
Lime: Lime	stone equivale	ent purchas	ed or applied,	tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin PLANNING SUBAREA: Northwest 2.1 COUNTY: Manitowac

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	41940	1153.3	93920	139.8		
Grains	29248	146.2	9749	97.4		
Hay or Grass Silage	28050	280.5	23375	233.7		
Pastured Cropland	8549	85.4	8549	85.4	-	
Other Field Crops	390	10.5	308	34.5	300	45.0
Vegetables	7786	170.1	7786	435.5	7786	175.2
Orchards				100000		
Berries	104	6.0	112	10.9	144	21.8
Nursery, Greenhouse						
Other Crops						
Totals	116067	1852.0	59199	1037.2	8200	242.0

TABLE	2-MANTIRE	PPOM	CUINE

	Hog & Pig	Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	15793	3077	3018	6095
1969	13083	2172	2205	4377
1972	12500	2000	2100	4100
et Manu	re Factor: T	ons per litter f	arrowed	7.23
	re Defecated:			29643
lutrient	s in Wet Manu	re: Nitrogen, t	ons	148
		Phosphorus,		42
		rnosphorus,	POIT9	15.4

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves
1964	89282	48919	40363
1969	82379	44226	38153
1972	88500	44600	43900
Wet Manure Per Anima	Factor: Tons	13.14	6,45
Wet Manure Tons, 197		586044	283155
	Defecated: Tons, 197 n Wet Manure: Nitro		869199 4868
	Phosp	horus, tons	869 4346

TABLE	4-MANURE	FROM	SHEEP	AND	HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1113	
1969	878	741
1972	500	400
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	805	5112
Nutrients in Wet Manure: Nitrogen, Tons	11	35
Phosphorus, Tons	2	5
Potash, Tons	8	31

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		112825		
1969		89425		
1972		119000		10000
Wet Manure Factor:	Lbs. per bird	82.9		
Wet Manure Defecated	1: Tons, 1972	4933		
Nutrients in Wet Man	ure:		Combined	
Ni	rogen, tons	77	-	
Pho	osphorus, tons	20		
Pot	ash, tons	17		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	3 (1) 377344	Number I-V farms   1788
Number of farms	2281	Acres in I-V farms 272983
Acres in farms	303599	Cropland I-V farms 219057
Cropland in farms	239071	Harvested cropland
Harvested cropland in f	arms 189878	I-V farms 177775

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	32162	3285	645	3930
GRAINS	52548	1747	6	17.53
Wheat	397	12	0	12
Oats	51730	1712	5	1717
Barley	347	20	0	20
Rye	34	2	0	2
OTHER FIELD CROPS	775	194	0	194
Soybeans	175	14	0	14
Potatoes	333	159	0	159
Sugar beets				
Field beans	657	5	0	5
HAY OR GRASS SILAGE	86587	1177	14	1191
PASTURED CROPLAND	31246	154	0	1.54
Cropland used for pasture	30050	148	0	148
Improved pasture	1196	6	0	6
VEGETABLES, SWEET CORN, MELONS	7786	812	27	839
ORCHARDS	114	43	0	43
BERRIES	22	6	0	6
NURSERY & GREENHOUSE PRODUCTS	66	23	1	24
OTHER CROPS	43	4	0	4
Total Fertilizer Used, Tons		7450	693	8143
Percent of Fertilizer Used		91	9	100

TABLE 7FERTILIZER U	SED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	em Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	10243	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	2403	1972			1795
Total	12646		nages for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	6576	100	mages 101 vac		
Nitrogen	1710			-	
Phosphorus	1841				
Potash	3025				

TABLE 9 -- SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2860	
Total Estima	ated Tons Applied on All E	iighways in 1972-73,

THAT MATERIALS AND HICHWAY DE-ICING

	Herbicides	Inse	cticides	Fungicides	Total	
Table 1			7.2	242.0	3131.2	
Manure: Ki	nd of	Tons	of Materials i	n Wet Manure D		
Livestoc		Manure	Nitrogen	Phosphorus	Potash	
Swine: Tab		29643	148	42	113	
Cattle: Ta		869199	4868	869	4346	
Sheep: Table 4		805	11	2	8	
Horses: Table 4		5112	3.5	5	31	
Chickens: Table 5		4933	77	20	17	
Turkeys: Table 5		***				
Total from Livestock, Tons		909692	5139	938	4515	
Fertilizers		Tons of C		ilizers Applie	d	
100000000000000000000000000000000000000			Primar	y Nutrients		
Ite	m	Total	Nitrogen	Phosphorus	Potasi	
Applied on Table 7	Cropland:	12646	1710	1841	3025	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9\_\_\_\_

(1) County, land area, acres includes water areas under 40 acres in size.

4148

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin

PLANNING SUBAREA: Northwest 2.1 COUNTY: Marinette

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	14850	408.3	3300	49.5		
Grains	7463	37.3	2488	24.8		
Hay or Grass Silage	11280	112.8	9400	94.0		
Pastured Cropland	5678	56.7	5678	56.7		
Other Field Crops	170	4.3	100	11.5	100	15.0
Vegetables	2313	50.5	2313	129.4	2313	52.0
Orchards				10000		
Berries	22	2.0	21	2.4	23	2.8
Nursery, Greenhouse Other Crops						
Totals	41776	671.9	23300	368.3	2436	69.8
Total Herbicides, In	secticide			0 1bs	67512	1110.0

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	4668	955	929	1884
1969	3981	814	803	1617
1972	3700	850	850	1700
Wet Manu	re Factor: To	ons per litter fa	arrowed	7,23
	re Defecated:			12291
Nutrient	s in Wet Manu	re: Nitrogen, to	ons	61
		Phosphorus,	tons	17
		Potash, tons		47

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	34389	19069	15320		
1969	27155	14393	12762		
1972	28300	13800	14500		
Wet Manure   Per Anima	Factor: Tons	13.14	6.45		
Wet Manure I		181332	93525		
	Defecated: Tons, 1972		274857		
Nutrients is	n Wet Manure: Nitroge		1539		
		rus, tons	275		
	Potash,	tons	1374		

TABLE 4-MANURE FROM SHEEP AND HORSES

Year	Item	Sheep & Lambs	Horses & Ponies
1964		470	
1969		226	361
1972		225	600
Wet Manure Factor	: Tons per animal	1.61	12.78
Wet Manure Defeca	ted: Tons, 1972	362	7668
Nutrients in Wet	Manure: Nitrogen, Tons	5	53
	Phosphorus, Tons		8
	Potash, Tons	la .	46

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	35138		
1969	21590		
1972	31000	200	1000
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	1285		
Nutrients in Wet Manure: Nitrogen, tons	20	Combined	
Phosphorus, tons Potash, tons	- 5		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	(1) 881856	Number I-V farms 647	
Number of farms	971	Acres in I-V farms 143155	
Acres in farms	188705	Cropland I-V farms 78621	
Cropland in farms	98534	Harvested cropland	
Harvested cropland in	farms 62034	I-V farms 52870	

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	11955	1518	77	1595
GRAINS	12804	1175	0	1175
Wheat	114	6	0	6
Oats	12461	1160	0	1160
Barley	119	8	0.	R
Rye	47		0	
OTHER FIELD CROPS	2.50	96	0	96
Soybeans	50	0	0	
Potatoes	200	94	0	94
Sugar beets				
Field beans	737	4	0.	4.
HAY OR GRASS SILAGE	25429	598	0	598
PASTURED CROPLAND	17719	110	.4	114
Cropland used for pasture	16937	98	4	102
Improved pasture	782	12	0	12
VEGETABLES, SWEET CORN, MELONS	2313	318	79	397
ORCHARDS	6	0	0	0
BERRIES	18	3	0	3
NURSERY & GREENHOUSE PRODUCTS	0	0	0	
OTHER CROPS	118	27	0	27
Total Fertilizer Used, Tons		3849	160	4009
Percent of Fertilizer Used		96	4	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	5043	Year	Government Cost/Shared	Cost/Shared	Total Tonnage
Liquid	1183	1972			2090
Total	6226		magaz for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	3238	101	mages for our	le i Necent 166	
Nitrogen	842				
Phosphorus	907				
Potash	1489				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	3013	
Total Estima	ted Tons Applied on All Hi	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbicide	s In	secticides	Fungicides	Total
Table 1 671.9	368.3		69.8	1110.0
Manure: Kind of	Ton	s of Material	ls in Wet Manure I	Defecated
Livestock	Manur	e Nitroge	en Phosphorus	Potash
Swine: Table 2	12291	61	17	47
Cattle: Table 3	274857	1539	275	1374
Sheep: Table 4	362	5		4
Horses: Table 4	7668	53	8	46
Chickens: Table 5	1285	20	5	4
Turkeys: Table 5	***			
Total from Livestock, Tons	296463	1678	306	1475
Fertilizers:	Tons of	Commercial 1	Fertilizers Applie	ed
		Pri	imary Nutrients	
Item	Total	Nitrogen	Phosphorus	Potasi
Applied on Cropland: Table 7	6226	842	907	1489
Lime: Limestone equiva Table 8	lent purch	ased or appl	ied, tons:	2090
Salts: Applied on all	Litabarana	name Table	0	4370

To Convert From

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin PLANNING SUBAREA: Northwest 2.1 COUNTY: Marquette

TARTE	1-FSTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972	

	Herbi	Herbicides Ins		icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	20610	566.7	4580	68.7		
Grains	3445	17.2	1148	11.4		
Hay or Grass Silage	7230	72.3	6025	60.2		
Pastured Cropland	3389	33.8	3389	33.8		
Other Field Crops	755	18.2	378	40.4	3 50	52.5
Vegetables	2368	51.7	2368	132.4	2368	53 +3
Orchards						114/112
Berries	25	1.8	26	2.7	27	4.6
Nursery, Greenhouse						
Other Crops						
Totals	37822	761.7	17914	349.6	2745	110.4
Total Herbicides, In				00 1bs	2745 58481	1221.7

#### TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total 3952 3240 2550 7.23 18436 92 26	
1964	14435	2070	1.882	3952
1969	14030	1680	1560	3240
1972	12500	1250	1300	2550
Wet Manu	re Factor: T	ons per litter f	arrowed	7.23
	re Defecated:			18436
		re: Nitrogen, t	ons	92
		Phosphorus,		26
				70

#### TABLE 3-MANURE FROM CATTLE

	Control of the last of the	Number Cattle and Calves				
Year	1964 20979 1969   18873 1972 20500 et Manure Factor: Tons Per Animal et Manure Defecated: Tons, 1972 et Manure Defecated: Tons, 1972 utrients in Wet Manure: Nitroge	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	20979	9799	11180			
1969	18873	8405	10468			
1972	20500	7000	13500			
		13.14	6.45			
		91980	87075			
Wet Manure	Defecated: Tons, 1972	Combined:	179055			
			1003			
		rus, tons	179			
	Potash,		895			

# TABLE 4-MANUEL FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2692	
1969	3077	375
1972	2200	400
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	3542	5112
Nutrients in Wet Manure: Nitrogen, Tons	50	35
Phosphorus, Tons	7	5
Potash, Tons	3.5	31

#### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	73264		
1969	30158		
1972	42000		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	1741		
Nutrients in Wet Manure: Nitrogen, tons	27	Combined	
Phosphorus, tons	7		
Potash, tons	6		

COUNTY, land area, acres (1)	291200	Number I-V farms 434
Number of farms	655	Acres in I-V farms   28875
Acres in farms	166026	Cropland I-V farms 70522
Cropland in farms	86151	Harvested cropland
Harvested cropland in farms	55256	I-V farms 49956

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	16598	1904	330	2234
GRAINS	6649	479	0	479
Wheat	183	6	0	6
Oats	5883	453	0	453
Barley	0	0	0	0
Rye	569	19	0	19
OTHER FIELD CROPS	2649	584	10	594
Soybeans	273	25	0	25
Potatoes	281	17	10	27
Sugar beets				
Field beans	601	0	0	0
HAY OR GRASS SILAGE	21173	446		447
PASTURED CROPLAND	11725	77		7.8
Cropland used for pasture	9789	75		76
Improved pasture	1936	2	0	2
VEGETABLES, SWEET CORN, MELONS	2368	767	25	792
ORCHARDS	20	0	0	0
BERRIES		4	0	4
NURSERY & GREENHOUSE PRODUCTS	516	100	12	112
OTHER CROPS	4	0	0	0
Total Fertilizer Used, Tons		4361	379	4740
Percent of Fertilizer Used		92	8	100

TABLE 7-FERTILIZER USED IN 1972		TABLE	8GROUND LI	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	5963	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1398	1972			4180
Total	7361	Ton	mages for Oth	er Recent Yea	rs
Primary Nutrients in Fertilizer	3828				
Nitrogen	995				-
Phosphorus	1072				
Potash	1761				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	1310	
Total Estin	nated Tons Applied on All Hi	ghways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides		cticides	Fungicides	Total 1221.7
Table 1	761.7	349.			
Manure: K	ind of	Tons	of Materials	in Wet Manure I	
Livesto		Manure	Nitrogen		Potash
Swine: Tal	ble 2	18436	92	26	70
Cattle: T	able 3	179055	1003	179	895
Sheep: Tal		3 542	50	7	35
Horses: Ta		5112	35	5	31
Chickens:		1741	27	7	6
Turkeys:		-			
	Livestock,	207886	1207	224	1037
Fertilizer	s:	Tons of (		rtilizers Applie	d
Te	em	Total	Nitrogen	Phosphorus	Potasi
Applied on Table 7		7361	995	1072	1761
	estone equivale le 8	ent purchas	sed or applie	ed, tons:	4180
	plied on all hi	E 1815			1900

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 .4047 907.2

98

### GREAT LAXES BASIN MATERIAL USAGE INVENTORY Agricultural Chemicals, Manures, Fertilizers, Line and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin FLANKING SUBARBA: Northwest 2.1 QUINTY: Menominee

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972 TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-W CENSUS FARMS, 1969

		Amount	100	Amount	Sungi	Amount	Number of farms	acres			I-V farms n I-V farms	
Or Cropa	Acres Treated	Used 100 1hs	Acres	100 lbs	Acres	100 lhs	Acres in farms				d I-V farms	
Corn		700 700		705 702	- TONESCH.	- 20x - 10x	Cropland in farms	In farms		Harvest	ed cropland	
Origina							databased cookrane	717 Edities			TA THEM	
May by Grass Silage   Pastured Cropland							Crops				Tons of Fertili	
Vegetables							C0388					
Orchards							GRAINS					
Nursery, Greenhouse							Wheat Oats					
Other Crops							Barley					
THE PARTY OF THE P							Rye					
							OTHER FIELD CROPS		-			
							Pocacoes					
Totals							Sugar beets					
Total Surbicides, Ins	secticides	Fungici	ides: 10	Q Ibs			Rield beans HAY OR CRASS SILAG	E	-			-
TABLE 7-MANURE FROM	SWINE						PASTURED CROPLAND					
THE RESERVE THE PARTY OF THE PA		400000					Cropland used fo					
Hog & Pig Inventory			June 1-8				Taproved pasture VEGETABLES, SWEET		-			
Year Dec. 1	Spri		Phil		Tota	12:	ORCHARDS					
1964	1						BERRIES	ice hacairine				
1969							NURSERY & GREENHOU OTHER CROPS	NA CHOUSES				
1972	4						Total Fertilizer D					
Vet Manure Factor: 3			rowed				Percent of Pertili	zer Used				
Net Manure Defecated: Nutrients in Wet Manu	re: Nirr	ogen, tor	0.56				TABLE 7FERTILIZE	B HERD IN 1979	N - 194-105 N	S-Charge	T TMPST/MP DOM	VALENT
With the sale of the sale	Phos	phorus, t	0018				- FBRI 10128	M. OCMP LS 1342	LABER	APPLIE		- townst
	Pota	sh, tous					Item.	Tons		Tonnage	111111111111111111111111111111111111111	
							Pertilizer Used		1	Covernmen		
TABLE 3-HANUES FROM	CAPTLE						on Crops: Solid		Year	Cost/Shar	ed Cost/Shared	Tounag
			Marinhaira	Cattle an	A Cartania		Total	-	1972			
		Cox	es & Heif			Steers,	Primary Nutrients	in	Tou	mages for	Other Recent Ya	ars
Tear Tota	12		Callved			Calves	Percilizer					11122
1964					-		Nitrogen.					
1969							Phosphorus Potash					
1972 4200	3.5	3	3050		1.89.50							
Per Animal	008						TAUT D. O. CALTUS ADD	STUDEN THE PROPERTY.	Ab. Contr.	W. COMMEN	I MINITETRAL U	PERMIT
							TABLE 9SALTS APP	BARR THE PRINCIP	May SIMI	D. COUNTY	o municipal ni	CINMINIS.
Tons, 1972								Tons Puruhe		To	ns Applied Per	
fer Manure Defecated:	Tone: 10	20 20000	nin to				Tear	Through St	CACO		"E" Mile	
Succience in West Manu	re: Witn	gen, tor	18.				1970-71 1971-72					
	Phos	phorus, t	1000				1972-73					
	Poca	th, tous					Total Satimated	Tons Applied	on All	Righways I	1972-73,	
							As Computed					
			-									
TABLE 4-MANURE FROM	County Said											
ABLE 4-MASURE FROM	200201200			Sheap &	Horses	1.6						
Tear	Item			Sheep 5 Lambs	Horses Ponls		TABLE 10-SUMMANY	OF AGRICULTUR	AL MATE	RIALS AND B	ICHWAY DE-ICIN	G:
Tear							TABLE 10-SUMMARY					G:
Tear 1964 1969					Ponls	PS	Chemicals:	Hundredweigh	it Appli	ed on Crop	land	
Teac 1964 1969 1922	Item					PS	Chemicals:	Hundredweig		ed on Crop		G Total
Tear 1964 1963 1972 1972  And Hamure Pactor: To	Item	75			Ponls	PS	Chemicals: Harb	Hundredweigh icides	nt Appli	ed on Crop	land Fungicides	Total
Tear 1964 1969 1972 60 Nature Pactor: To	Item	75			Ponls	PS	Chamicals:  Table 1  Manure: Kind of Livestock	Hundredweigh icides	nt Appli Insections of F	ed on Crop	land	Total
Tear 1964 1963 1972 60 Nature Pactor: To	Item Ons per an Tons, 19 re: Witro	Men, Tons horus, To	s ons		Ponls	PS	Table 1  Handre: Kind of Livestock Swine: Table 2	Hundredweigh	nt Appli Insections of F	ed on Crop	land Fungicides	Total
Tear 1964 1963 1972 1972  And Hamure Pactor: To	Item Ons per an Tons, 19 re: Witro	gen, Tons	s ons		Ponls	PS	Chamicals:  Table 1  Manure: Kind of Livestock	Hundredweigh	nt Appli Insections of F	ed on Crop	land Fungicides	Total
Tear 1964 1963 1972 Oct Manure Pactor: Tear and Manure Defected: Mattington in West Manu	Item Ons per an Tons, 19 ne: Witro	gen, Tons horus, Tons	s ons		Ponls	PS	Chamicals:    Harboard     Hamure: Kind of Livestock     Swine: Table 2     Cartle: Table 3     Sheep: Table 4	Hundredweigh icides To Mann	nt Appli Insections of F	ed on Crop	land Fungicides	Total
Tear 1964 1963 1972 Oct Manure Pactor: Tear and Manure Defected: Mattington in West Manu	Item Ons per an Tons, 19 ne: Witro	gen, Tons horus, Tons	s ons		Ponls	PS	Table 1  Manure: Kind of Livestock Swime: Table 2 Cartle: Table 3 Sheep: Table 4 Horses: Table 4 Chickens: Table 3	Hundredweigh icides To Mann	nt Appli Insections of F	ed on Crop	land Fungicides	Total
Tear 1964 1963 1972 60 Hanure Pactor: To 60 Hanure Onfected: Scriedts in Wes Pagu ASLE 5— Manual FROM	Item Ons per an Tons, 19 Tens: Without Phosp Fotas CHICKENS A	gen, Tons horus, Tons	s ons	Lambs	Ponls	PS	Chemicals:  Table 1  Hamure: Kind of Livestock Swine: Table 2 Cartle: Table 3 Sheep: Table 4 Horses: Table 4 Turkeys: Table 3 Turkeys: Table 3	Hundredwelgh Licides to Many	nt Appli Insections of F	ed on Crop	land Fungicides	Total
Tear 1964 1963 1972  at Manure Pactor: To the Manure Defected: Scrington in Wes Page ARLE 5 - Manure Page Year	Item Ons per an Tons, 19 ne: Witro	gen, Tons horus, Tons	s ons	Lambs	200	7	Table 1  Manure: Kind of Livestock Swime: Table 2 Cartle: Table 3 Sheep: Table 4 Horses: Table 4 Chickens: Table 3	Hundredwelgh Licides to Many	nt Appli Insections of F	ed on Crop	land Fungicides	Total
Tear 1964 1969 1972 at Manure Pactor: Des Manure Defeated: Scrience in Wes Manure Page Page Page Page Page Page Page Pag	Item Ons per an Tons, 19 Tens: Without Phosp Fotas CHICKENS A	gen, Tons horus, Tons	s ons	Lambs	Pop Is	2. Turkeya	Chamicals:    Harb   Table 1	Hundredweighticides To Manik	nt Appli Insections of P	ed on Crop ides	land Fungicides	Total
Tear  1964 1969 1972 65 Manure Defector: Tear Continue Defector: Tear MANUE 5-Manure Page Tear Tear 1964 1969	Item Ons per an Tons, 19 Tens: Without Phosp Fotas CHICKENS A	gen, Tons horus, Tons	s ons	Lambs	Pop Is	2. Turkeya	Chemicals:  Table 1  Hamure: Kind of Livestock Swins: Table 2 Cartile: Table 3 Sheep: Table 4 Horses: Table 4 Horses: Table 3 Turkeys: Table 3 Turkeys: Table 3 Toral from Livesto Tona Fertilizers:	Hundreshweighticides  Tous tous	Insectic	ed on Crop dides Materials i Nitrogen	Pungicides  Net Munure De Phosphoris  Ilizers Applied y Nutrients	Total fecated Potasi
Tear  1964 1969 1972 60 Manure Factor: Dec Manure Defeated: Octions in New Years  ANLE 5 Manure Fault  Tear  1964 1969 1972	Item  Ons per an  Tons, 19  Fer Hitmore  Fotas  CHICKENS &	72 gen, Tous horms, Tous TOUREYS	s ons	Lambs	Pop Is	2. Turkeya	Chamicals:    Harb     Table 1	Hundredweighticides To Mans	Insectic	ed on Crop ides lacerials i	Pungicides  Net Amure De  Phosphorus  Llizers Applied	Total fecated Potasi
Tear  1964 1963 1972 et Manure Pactor: In Rec Manure Defecated: Scrington in Rec Manue Page  Fear  1964 1969 1972 et Manure Pactor: In Rec Manure Defecated: Manure Defecated:	Item  Ons per an  Tons, 19  re: Witro  Phase  Fotas  CHICKENS A  Tons, 19  Tons, 19	72 gen, Tous horms, Tous TURREYS	s ons	Lambs	Pop Is	2. Turkeya	Chemicals:    Hard     Table 1     Hamure: Kind of     Livestock     Swine: Table 2     Cartle: Table 3     Sheep: Table 4     Horses: Table 3     Turkeys: Table 5     Total from Livesto     Tona     Fertilizers:     Lien     Applied on Croplan     Applied on Croplan     Constant     Consta	Hundredweighticides To Mans	Insectic	ed on Crop dides Materials i Nitrogen	Pungicides  Net Munure De Phosphoris  Ilizers Applied y Nutrients	Total fecated Potasi
Tear  1964 1969 1972 60 Manure Pactor: In Med Manure Defecated: ARLE 5 MARRIE FROM  Year  1964 1969 1972 48 Manure Ractor: In Sec Manure Defecated:	Item  Ons per an  Tons, 19  re: Witro  Phase  Fotas  CHICKENS A  Tons, 19  Tons, 19	72 gen, Tous horms, Tous TURREYS	s ons	Lambs	Ponls 200	2. Turkeya	Chemicals:    Harb     Table 1     Hamure: Kind of     Investock     Swine: Table 2     Cartle: Table 3     Sheep: Table 4     Horses: Table 4     Chickens: Table 5     Total from Liveato     Total from Liv	Hundredweighticides To Manual Tons of Total	nt Applifinsactions of bare.	ed on Crop ides  accrials i Nitrogen  roisi Fart Primar trogen	Pungicides  Net Manure De Phosphorus  Litzers Applied Nutrients Phosphorus	Total fecated Potasi
Tear  1964 1963 1972  ALLE S HANGE FROM  Year  1964 1969 1972  ALLE S HANGE FROM  Year  1964 1969 1972  ALLE S HANGE FROM  MARKET S HAN	Item  Tons, 19  re: Midro  Those  Fotas  CHICKENS &  Toms, 19  Tons, 19	72 gen, Fonnierus, Tohn Tons TURREYS	s ons	Lambs	Pop Is	2. Turkeya	Chemicals:  Table 1  Manure: Kind of Livestock Swine: Table 2 Cartic: Table 3 Sheep: Table 4 Horses: Table 4 Horses: Table 5 Turkeys: Table 5 Total from Livesto Total from Livesto Total from Croplan Table 7  Lime: Limestone 0	Hundredweighticides To Manual Tons of Total	nt Applifinsactions of bare.	ed on Crop ides  accrials i Nitrogen  roisi Fart Primar trogen	Pungicides  Net Manure De Phosphorus  Litzers Applied Nutrients Phosphorus	Total fecated Potasi
1964 1963 1972 40 1963 1972 40 Hanure Pactor: To the Manure Defected for West Plant  Year 1964 1969 1972 40 Manure Pactor: Il the Ma	Toes  Ons per an Tons, 19 Tes: Witro Thuss Fotas  CHICKENS A  Toes  Tous, 19 Tous, 19 Tes  pagen, cons thorus, to	72 gen, Fonnierus, Tohn Tons TURREYS	s ons	Lambs	Ponls 200	2. Turkeya	Chamicals:    Harb     Table 1	Hundredweighticides To Manis	nt Appli	ed on Crop ides  accrials i Nicrogen  refal Fact Primar trosen	Pungicides  Net Manure De Phosphorus  Litzers Applied Nutrients Phosphorus	Total fecated Potasi
Tear  1964 1963 1972  AND PARTIES FACTOR: To Manuar Pactor: To Max Factor: In Max Factor: Il 1972  BY Manuar Pactor: Il 1972  BY Manuar Factor: Il 1972  BY	Item  Tons, 19  re: Midro  Those  Fotas  CHICKENS &  Toms, 19  Tons, 19	72 gen, Fonnierus, Tohn Tons TURREYS	s ons	Lambs	Ponls 200	2. Turkeya	Chemicals:  Table 1  Manure: Kind of Livestock Swine: Table 2 Cartic: Table 3 Sheep: Table 4 Horses: Table 4 Horses: Table 5 Turkeys: Table 5 Total from Livesto Total from Livesto Total from Croplan Table 7  Lime: Limestone 0	Hundredweighticides To Manis	nt Appli	ed on Crop ides  accrials i Nicrogen  refal Fact Primar trosen	Pungicides  Net Manure De Phosphorus  Litzers Applied Nutrients Phosphorus	Total
Tear  1964 1963 1972 60 Namure Pactor: To see Namure Defected: Neriants in Wes Page  ASLE 5 Manuse Factor: Il 1968 1969 1972 60 Manuse Factor: Il see Manuse Pactor: Il Manuse Pactor: Il see Manuse Factor: Il see Manuse Pactor: Il see Manuse P	Toes  Ons per an Tons, 19 Tes: Witro Thuss Fotas  CHICKENS A  Toes  Tous, 19 Tous, 19 Tes  pagen, cons thorus, to	72 gen, Fonnierus, Tohn Tons TURREYS	s ons	Lambs	Ponls 200	2. Turkeya	Chamicals:    Harb     Table 1	Hundredweighticides To Manis	nt Appli	ed on Crop ides  accrials i Nicrogen  refal Fact Primar trosen	Pungicides  Net Manure De Phosphorus  Litzers Applied Nutrients Phosphorus	Total fecated Potasi

Milograms (kg) Hectare (ha) Kilograms (kg)

907.2

Founds (1b) Acres (acre) Tons (ton)

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin
PLANNING SUBAREA: Northwest 2.1 COUNTY: Oconto

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	31770	873.6	7060	105-9		
Grains	12720	63.6	4240	42.4		
Hay or Grass Silage	18150	181.5	15125	151.2		
Pastured Cropland	8537	85.3	8537	85.3		
Other Field Crops	220	6.2	202	23.0	200	30.0
Vegetables	7160	156.4	7160	400-5	7160	161.1
Orchards			- 3-			
Serries	57	5.2	53	6.3	58	7.1
Nursery, Greenhouse						
Other Crops						
		A 39				
Totals		1371.8	42377	814.6	7418	198.2
Total Herbicides, In	secticide	s, Fungio	ides: 10	0 lbs	128409	2384.6

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	8383	1663	1573	3236
1969	8829	1207	1251	2458
1972	7900	1400	1400	2800
et Manu	re Factor: T	ons per litter f	arrowed	7,23
	re Defecated:			20244
Sutrient	s in Wet Manu	re: Nitrogen, t	ons	101
		Phosphorus.	tons	28

Potash, tons\_

TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves
Year Total		Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	63 569	36358	27211
1969	53423	29379	24044
1972	58000	29700	28300
Wet Manure Per Animal	actor: Tons	13.14	6.45
Wet Manure I Tons, 1972		390258	182535
Wet Manure I	Defecated: Tons, 197	2 Combined:	572793
Nutrients in	Wet Manure: Nitro	gen, tons	3208
	Phosp	horus, tons	573
	Potas	h, tons	2864

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	831	
1969	687	554
1972	500	300
Wet Manure Factor: Tons per animal	1,61	12.78
Wet Manure Defecated: Tons, 1972	805	3834
Nutrients in Wet Manure: Nitrogen, Tons	11	26
Phosphorus, Tons	2	4
Potash, Tona	8	23

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	54008		
1969	38175		
1972	48000	2000	20080
Wet Manure Factor: Lbs. per bird	82.9	365	89.63
Wet Manure Defecated: Tons, 1972	1990		
Nutrients in Wet Manure: Nitrogen, tons	31	Combined	1257 20
Phosphorus, tons	8		5
Potash, tons	7		4

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	640640	Number I-V farms 1208
Number of farms	1614	Acres in I-V farms 228366
Acres in farms	271820	Cropland I-V farms 148576
Cropland in farms	170033	Harvested cropland
Harvested cropland in farms	116309	I-V farus 107388

	Crop	Tons o	f Fertilizer	zer Used
Crops	Acres	Dry	Liquid	Total
CORN	28754	3776	347	4123
GRAINS	23497	2083	6	2089
Wheat	99	9	0	9
Oats	23042	2056	6	2062
Barley	141		0	11
Rye	136	1	0	
OTHER FIELD CROPS	433	169	0	169
Soybeans	0			
Potatoes	242	132	0	132
Sugar beets				
Field beans	736	3	0	3
HAY OR GRASS SILAGE	47.844	1483	9	1492
PASTURED CROPLAND	29509	277	9	286
Cropland used for pasture	28301	2.56	- 9	265
Improved pasture	1208	2.1	0	21
VEGETABLES, SWEET CORN, MELONS	7160	1030	67	1097
ORCHARDS	14		0	
BERRIES	47	11	0	11
NURSERY & GREENHOUSE PRODUCTS	0			
OTHER CROPS	2	2	0	2
Total Fertilizer Used, Tons		8835	438	9273
Percant of Fertilizer Used		95	5	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

Item	Tons	1
Fertilizer Used on Crops: Solid	11665	
Liquid	2736	_] [
Total	14401	11
Primary Nutrients in Fertilizer	7489	
Nitrogen	1947	1
Phosphorus	2097	
Potash	3445	3

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	3147	
Total Estimat	red Tons Applied on All Hi	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbicide	s Ins	ecticides	Fungicides	Total
Table 1   1371.8		.6	198,2	2384.6
Manure: Kind of	Tons	of Material	s in Wet Manure D	
Livestock	Manure	Nitroger	n Phosphorum	Potash
Swine: Table 2	20244	101	88	77
Cattle: Table 3	572793	3208	573	2864
Sheep: Table 4	805	11	2	8
Horses: Table 4	3834	26	14	23
Chickens: Table 5	1990	3.1	8	7
Turkeys: Table 5	1257	20	.5.	- 16
Total from Livestock, Tons	600923	3397	680	2983
Fertilizers:	Tons of	Commercial Fe	ertilizers Applie	d
A. S.		Pri	mary Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	14401	1947	2097	3445
Lime: Limestone equiva		- Inches		2076

To Convert From
Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 ,4047 907.2

Salts: Applied on all highways, tons: Table 9\_\_\_\_

(1) County, land area, acres includes water areas under 40 acres in size.

4564

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin

PLANNING SUBAREA: Northwest 2.1 COUNTY: Outagamie

TABLE 1ESTIM	ATED AMOUNT	S OF	CHEMI CALS	USED	ON	CROPS,	1972
--------------	-------------	------	------------	------	----	--------	------

	Herbi	cides	Insecticides		Fungicides		
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	
Corn	68040	1871.1	15120	226.8			
Grains	21694	108.4	7231	72.3			
Hay or Grass Silage	23940	239.4	19950	199.5			
Pastured Cropland	7038	70.3	7038	70.3			
Other Field Crops	765	15.7	95	6.1	50	7.5	
Vegetables	8495	185.6	8495	475.1	8495	191.1	
Orchards		+ 1					
Berries	101	4.9	113	10.4	113	23.7	
Nursery, Greenhouse							
Other Crops							
M-1-1		21.22.1	contra	1000 5	00.00	222.3	
Totals Total Herbicides, In	130073		58042	1060.5 00 1bs	86.58 1.96.773	3778.2	

#### TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	29703	4403	4470	8873
1969	26588	3814	3716	7530
1972	25500	4000	4200	8200
Wet Manua	e Factor: To	ons per litter fa	arrowed	7.23
	e Defecated:			59286
		re: Nitrogen, to	ons	296
		Phosphorus,		83

## TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves					
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	96079	52362	43717				
1969	87513	45203	42310				
1972	94000	45600	48400				
Wet Manure Per Anima	Factor: Tons	13.14	6.45				
Wet Manure Tons, 197		599184	312180				
Wet Manure	Defecated: Tons, 1	972 Combined:	911364				
	n Wet Manure: Nit		5104				
		sphorus, tons	911				
		ash, tons	4557				

Year Item	Sheep & Lambs	Horses & Ponies
1964	1130	
1969	530	781
1972	500	500
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	805	6390
Nutrients in Wet Manure: Nitrogen, Tons	11	1414
Phosphorus, Tons	2	6.
Potash, Tons	8	38

#### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	89173		-
1969	81200		
1972	105000		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	43.52		
Nutrients in Wet Manure: Nitrogen, tons	68	Combined	
Phosphorus, tons	17		
Potash, tons	15		

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	406016	Number I-V farms 17	80
Number of farms	2140	Acres in I-V farms 26	5162
Acres in farms	297934	Cropland I-V farms 21	3616
Cropland in farms	236285	Harvested cropland	
Harvested cropland in farm	s 181957	I-V farms 16	9981

	Crop	Tons of	f Fertilizer Used		
Crops	Acres	Dry	Liquid	Total	
CORN	55801	7864	1260	9124	
GRAINS	36363	2492	1	2493	
Wheat	217	21	0	21	
Oats	35446	2434	1	2435	
Barley	380	28	0	28	
Rye	225	5	0	5	
OTHER FIELD CROPS	1362	163	6	169	
Soybeans	1183	121	6	127	
Potatoes	49	10	0	10	
Sugar beets					
Field beans	242	0	0	0	
HAY OR GRASS SILAGE	70169	2386	20	2406	
PASTURED CROPLAND	26723	309	0	309	
Cropland used for pasture	24770	296	0	296	
Improved pasture	1953	13	0	13	
VEGETABLES, SWEET CORN, MELONS	8495	1422	100	1522	
ORCHARDS	135	72	0	72	
BERRIES	4	31	0	1	
NURSERY & GREENHOUSE PRODUCTS	. 19	11	0	11	
OTHER CROPS	42	0	0	0	
Total Fertilizer Used, Tons		14720	1387	16107	
Percant of Fertilizer Used	100	91	9	100	

TABLE 7-FERTILIZER U	SED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALBNI		
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	20261	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	47.53	1972			4753		
Total	25014	Tonnages for Other Recent Years					
Primary Nutrients in Fertilizer	13007	101	atages sor out				
Nitrogen	3382			-			
Phosphorus	3642						
Potash	5983						

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile		
1970-71				
1971-72				
1972-73	2256			
	timated Tons Applied on All H: mputed 3272	Ighways in 1972-73,		

## TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Inse	cticides	Fungicides	Total	
Table 1	2495.4	1060	1.5	222.3	3778.2	
Manure: K	ind of	Tons	of Material	ls in Wet Manure D		
Livesto	ck	Manure	Nitroge	en Phosphorus	Potash	
Swine: Ta	ble 2	59286	296	83	225	
Cattle: T	able 3	911364	5104	911	4557	
Sheep: Ta	ble 4	80.5		2	8	
Horses: Table 4		6390	44	6	3.8	
Chickens: Table 5		43.52	68	17	15	
Turkeys: Table 5					20-34 M	
Total from To	Livestock,	982197	5523	1019	4843	
Fertilizer	s:	Tons of		Fertilizers Applie	d	
			Pr	imary Nutrients	-	
It	em	Total	Nitrogen	Phosphorus	Potash	
Applied on Table 7	Cropland:	25014	3382	3642	5983	
	estone equiva le 8	lent purchas	sed or appl	ied, tons:	4753	
Caltar Am	plied on all	hd abresse to	ange Tabla	0	3272	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 ,4047 907.2

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin PLANNING SUBAREA: Northwest 2.1 COUNTY: Shawano

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS.	1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	42660	1173.1	9480	142.2		
Grains	20733	103.6	6911	69.1		
Hay or Grass Silage	26610	266.1	22175	221.7		
Pastured Cropland	9421	94.2	9421	94.2		
Other Field Crops	175	4.8	150	17.2	150	22.5
Vegetables	851	18.6	851	47.6	851	19.1
Orchards						
Berries	15	1.2	15	1.7	16	2.5
Nursery, Greenhouse						
Other Crops						
Totals	100/165	1661.6	49003	593.7	1017	44.1
Total Herbicides, In					150485	2299.4

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	14405	2553	2157	4710
1969	9576	1825	1714	3539
1972	8200	1650	1650	3300
let Manu	re Factor: T	ons per litter fa	arrowed	7,23
Wet Manu	re Defecated:	Tons, 1972		23859
Nutrient	s in Wet Manu	re: Nitrogen, to	ons	119
		Phosphorus,	tons	33
		Dotach ton	0	0.1

# TABLE 3-MANUER FROM CATTLE

	MORE FROM CATTLE	Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	92333	54323	38010
1969 1972	76920 42000	43442 23050	33478 18950
Wet Manure Per Anima	Factor: Tons	13.14	6.45
Wet Manure Tons, 197		302877	122228
	Defecated: Tons, 1972 in Wet Manure: Nitroge	n, tons	425105 2381
	Phospho Potash,	rus, tons	425 2126

#### TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1318	
1969	619	566
1972	500	400
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	805	5112
Nutrients in Wet Manure: Nitrogen, Tons	11	35
Phosphorus, Tons	2	5
Potash, Tons	8	3.1

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		80089		
1969		49332		
1972		59000	775	555
Wet Manure Factor: L	os. per bird	82.9		
wet Manure Defecated:	Tons, 1972	2446		
Nutrients in Wet Manu	re:		Combined	
	gen, tons	3.8		
Phos	phorus, tons	10		
Pota	sh, tons	9		

## TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	588160	Number I-V farms 1606
Number of farms	2010	Acres in I-V farms 300121
Acres in farms	343182	Cropland I-V farms 180180
Cropland in farms	201205	Harvested cropland
Harvested cropland in farms	144620	I-V farms 134854

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	33316	3938	311	4249
GRAINS	31132	2875	10	2885
Wheat	237	24	0	24
Oats	30556	2828	10	2838
Barley	195	18	0	18
Rye	104	5	0	5
OTHER FIELD CROPS	177	73	0	73
Soybeans	47	4	0	
Potatoes	128	66	0	66
Sugar beets				
Field beans	440	5	0	5
HAY OR GRASS SILAGE	70370	2324	2	2326
PASTURED CROPLAND	35227	295	0	295
Cropland used for pasture	32967	292	0	292
Improved pasture	2260	3	0	3
VEGETABLES, SWEET CORN, MELONS	851	126	9	135
ORCHARDS	9		0	1
BERRIES	9		0	1
NURSERY & GREENHOUSE PRODUCTS	21	0	0	0
OTHER CROPS	17	0	0	0
Total Fertilizer Used, Tons		9638	332	9970
Percent of Fertilizer Used	1	97	3	100

## TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	-
Fertilizer Used on Crops: Solid	12542	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	2941	1972			8337
Total	15483		pages for Oth	er Recent Yes	
Primary Nutrients in Fertilizer	8051	1011	mages for our	L MCCOIL 100	
Nitrogen	2093				
Phosphorus	2254				
Potash	3704				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2601	
Total Estima	ated Tons Applied on All Hi	ghways in 1972-73,

	Herbicides	Ins	ecticides	Fungicides	Total
Table 1	1661.6	593	.7	44.1	2299.4
Manure: Kind	of	Tons	of Materials	in Wet Manure D	efecated
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Table	2	23859	119	33.	91
Cattle: Tabl	e 3	425105	2381	425	2126
Sheep: Table		805		2	8
Horses: Tabl		5112	35	5	31
Chickens: Ta	ble 5	2446	38	10	9
Turkeys: Tab	le 5	***		***	
Total from Li Tons	vestock,	457327	2584	475	2265
Fertilizers:		Tons of	Commercial Fer	tilizers Applie	d
			Prima	ry Nutrients	100000
Item		Total	Nitrogen	Phosphorus	Potash
Applied on Cr Table 7	opland:	15483	2093	2254	3794

Salts: Applied on all highways, tons: Table 9

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin PLANNING SUBAREA: Northwest 2.1 COUNTY: Sheboygan

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	42570	1170.6	9460	141.9		
Grains	22328	111.6	7443	74.4		
Hay or Grass Silage	21840	218.4	18200	182.0		
Pastured Cropland	5984	59.8	5984	59.8		
Other Field Crops	205	4.5	60	5.8	50	7.5
Vegetables	10203	222.9	10203	570.7	10203	229.6
Orchards	111111111111111111111111111111111111111	11000				
Berries	109	5,4	121	11.2	122	25.2
Nursery, Greenhouse Other Crops						
Totals Total Herbicides, In	103239	1793.2	51471	1045.8	10375	262.3

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	18745	3647	3398	7045
1969	16416	2600	2678	5278
1972	14500	3000	3100	6100
Wet Manu	re Factor: T	ons per litter f	arrowed	7.23
	re Defecated:			44103
		re: Nitrogen, to	ons	221
		Phosphorus,		62
				168

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	74099	39909	34190
1969	66203	39909 34637	31566
1972	70000	33000	37000
Wet Manure Per Anima	Factor: Tons	13:14.	6.45
Wet Manure Tons, 197		433620	238650
Wet Manure	Defecated: Tons, 1972	Combined:	672270
Nutrients i	n Wet Manure: Nitroge	n, tons	3765
		rus, tons	672
	Potash,	tons	3361

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1813	
1969	850	946
1972	500	400
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	805	5112
Nutrients in Wet Manure: Nitrogen, Tons	11	35
Phosphorus, Tons	2	5
Potash, Tons	8	31

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	151595		
1969	102122		
1972	132000	200	777
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	5471		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	85		
Phosphorus, tons	22		
Potash, tons	19		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 323392	Number I-V farms	1444
Number of farms	1869	Acres in I-V farms	216177
Acres in farms	238775	Cropland I-V farms	175072
Cropland in farms	190445	Harvested cropland	
Harvested cropland in fa	arms     5 4 4	I-V farms_	141878

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	34835	3482	239	3721
GRAINS	36541	1152	3	1155
Wheat	1402	57	0	57
Oats	34573	1072	3	1075
Barley	229	15	0	15
Rye	55		0	1
OTHER FIELD CROPS	306	25	0	25
Soybeans	189	14	0	14
Potatoes	32	7	0	7
Sugar beets				
Field beans	779	6	0	6
HAY OR GRASS SILAGE	61198	7.55	7	762
PASTURED CROPLAND	23321	95	4	99
Cropland used for pasture	21991	91	4	95
Improved pasture	1330	14	0	4
VEGETABLES, SWEET CORN, MELONS	10203	1141	61	1202
ORCHARDS	142	16		17
BERRIES	7	1	0	1
NURSERY & GREENHOUSE PRODUCTS	14	5	0	5
OTHER CROPS	29		0	2
Total Fertilizer Used, Tons		6680	315	6995
Percent of Fertilizer Used		95	5	0

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

		-	APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	8799	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	2064	1972			2580
Total	10863		nages for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	5649	101	mages for our	LI IN COIL TO	
Nitrogen	1469				
Phosphorus	1582				
Potash	2598				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		THE RESIDENCE OF THE PARTY OF T
1972-73	4355	
Total Estima As Comput	ted Tons Applied on All H	ighways in 1972-73,

	Herbicides	Inse	cticides	Fungicides	Total
Table 1	1793.2	1045	.8	262.3	3101.3
Manure: Ki	ind of	Tons	of Materials	in Wet Manure De	efecated
Livesto	ck	Manure	Nitrogen	Phosphorus	Potash
Swine: Tab	le 2	44103	221	62	168
Cattle: Ta	able 3	672270	3765	672	3361
Sheep: Tab	ole 4	805	11	2	8
Horses: Ta	able 4	5112	35	5	3.1
Chickens:	Table 5	5471	85	22	19
Turkeys: 7	Table 5				
Total from Tor	Livestock,	727761	4117	763	3 587
Fertilizers	9 :	Tons of C	Commercial Fer	tilizers Applie	đ
			Prima	ry Nutrients	
Ite	em	Total	Nitrogen	Phosphorus	Potas
Applied on Table 7	Cropland:	10863	5649	1582	2598
	estone equival le 8	ent purchas	sed or applied	, tons:	2 580

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin PLANNING SUBAREA: Northwest 2.1 COUNTY: Waupaca

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS,	1972	

Crops         Treated         100 lbs         Treated         100 lbs         Treated           Corn         43470         1195,4         9660         144,9           Grains         12146         60.7         4049         40.4           Hay or Grass Silage         18840         188.4         15700         157.0           Pastured Cropland         7714         77.1         7714         77.1           Other Field Crops         1330         38.3         1310         149.6         1300		des Fungici	des
Grains         12146         60.7         4049         40.4           Bay or Grass Silage         18840         188.4         15700         157.0           Pastured Cropland         7714         77.1         7714         77.1           Other Field Crops         1330         38.3         1310         49.6         1300           Vegetables         1848         40.4         1848         103.4         1848           Orchards         8         3.8         87         8.1         87           Nursery, Greenhouse         8         3.8         87         8.1         87	or /	Ised Acres	mount Used 00 1bs
Grains         12146         60.7         4049         40.4           Hay or Grass Silage         18840         188.4         15700         157.0           Pastured Cropland         7714         77.1         7714         77.1           Other Field Crops         1330         28.3         1310         49.6         1300           Vegetables         1848         40.4         1848         103.4         1848           Orchards         Berries         78         3.8         87         8.1         87           Nursery, Greenhouse         8         3.8         87         8.1         87	14	44.9	
Pastured Cropland         7714         77.1         7714         77.1           Other Field Crops         1330         38.3         1310         149.6         1300           Vegetables         1848         40.4         1848         103.4         1848           Orchards         Berries         78         3.8         87         8.1         87           Nursery, Greenhouse         87         8.1         87         8.1         87		40.4	
Pastured Cropland         7714         77.1         7714         77.1           Other Field Crops         1330         38.3         1310         149.6         1300           Vegetables         1848         40.4         1848         103.4         1848           Orchards         Berries         78         3.8         87         8.1         87           Nursery, Greenhouse         87         8.1         87         8.1         87	Grass Silage	57.0	
Other Field Crops         1330         38.3         1310         149.6         1300           Vegetables         1848         40.4         1848         103.4         1848           Orchards         Berries         78         3.8         87         8.1         87           Nursery, Greenhouse         3.8         87         8.1         87         8.1         87		77.1	
Orchards         3.8         87         8.1         87           Nursery, Greenhouse         87         8.1         87         8.1         87		49.6 1300	195.0
Berries 78 3.8 87 8.1 87 Nursery, Greenhouse	bles !	03.4 1848	41.6
Nursery, Greenhouse	ds		
		8.1 87	18.2
Other Crops	y,Greenhouse		
	Crops		
			254.8

TADID	2-MANURE	PROM	CUINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	19824	3638	3442	7080
1969	16567	2764	2484	5248
1972	14000	2800	2900	5700
Wet Manu	re Factor: T	ons per litter f.	arrowed	7.23
	re Defecated:			41211
Nutrient	s in Wet Manu	re: Nitrogen, to	ons	206
		Phosphorus,		58
		Potash, ton		157

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	71743	39601	32142			
1969	65806	34722	31084			
1972	70500	32700	37800			
Wet Manure Factor: Tons Per Animal		13.14	6.45			
Wet Manure Defecated: Tons, 1972		429678	243810			
	Defecated: Tons,		673488 3772			
Nutrients in Wet Manure: Nitroge Phospho			673			
		tash, tons	3367			

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1935	
1969	1126	768
1972	1100	300
Wet Manure Factor: Tons per animal	1,61	12.78
Wet Manure Defecated: Tons, 1972	1771	3.834
Nutrients in Wet Manure: Nitrogen, Tons	25	26
Phosphorus, Tons	4	4
Potash, Tons	18	23

# TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		78208		
1969		67883		
1972		84000		
Wet Manure Fac	tor: Lbs. per bird	82.9		
wet Manure Def	ecated: Tone 1972	3482		
Nutrients in W	Manure: Nitrogen, tons	54	Combined	
	Phosphorus, tons	14		
	Potash, tons	12		

## TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	480384	Number I-V farms	1424
Number of farms	1974	Acres in I-V farms	264541
Acres in farms	323295	Cropland I-V farms	166203
Cropland in farms	194028	Harvested cropland	
Harvested cropland in farms	134101	I-V farms_	122356

	Crop	Tons o	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total		
CORN	36828	4474	487	4961		
GRAINS	25008	2116	19	2135		
Wheat	136	8	0	8		
Oats	24075	2059	19	2078		
Barley	119	12	0	12		
Rye	627	34	0	34		
OTHER FIELD CROPS	2065	1358	0	1358		
Soybeans	131	8	.0	8		
Potatoes	1932	1348	0	1348		
Sugar beets						
Field beans	560	2	0	2		
HAY OR GRASS SILAGE	57616	1246	0	1246		
PASTURED CROPLAND	26315	217	0	217		
Cropland used for pasture	24978	174	0	174		
Improved pasture	1337	43	0	43		
VEGETABLES, SWEET CORN, MELONS	1848	251	0	251		
ORCHARDS	103	27	0	27		
BERRIES	4	1	0	1		
NURSERY & GREENHOUSE PRODUCTS	10	0	1	1		
OTHER CROPS	16	1	0			
Total Fertilizer Used, Tons		9693	507	10200		
Percent of Fertilizer Used		95	5	100		

TABLE 7-FERTILIZER	JSED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	12831	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	3010	1972			8556
Total	15841		names for Oth	er Recent Yes	
Primary Nutrients in Fertilizer	8237	1011	nages for our		
Nitrogen	2142	-			
Phosphorus	2306				
Potash	3789				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2117	
Total Estim As Compu	ated Tons Applied on All H	ighways in 1972-73,

# MARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	Inse	cticides	Fungicides 254.8	Total 2539.4
Table 1	1604.1			The state of the s	
Manure: K	ind of			s in Wet Manure D	
Livesto	ck.	Manure	Nitroge		Potash
Swine: Ta	ble 2	41211	206	58	1.57
Cattle: T		673488	3772	673	3367
Sheep: Ta		1771	25	4	18
Horses: T		3834	26	4	23
Chickens: Table 5		3482	54	14	12
Turkeys: Table 5					
Total from Livestock, Tons		723786	4083	7.53	3577
Fertilizer	in a	Tons of C	ommercial F	ertilizers Applie	đ
rertifizer	19 -			mary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7		15841 2142		2306	3789
	estone equiva	alent purchas	ed or appli	ed, tons:	8556
	plied on all	hichways to	ns: Table	9	3070

To Convert From Pounds (1b) Acres (acre) Tons (ton)

Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime and	Highway	De-Icing	Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin

PLANNING SUBAREA: Northwest 2.1 COUNTY: Waushara

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	27630	759.8	6140	92.1		
Grains	4592	22.9	1531	15.3		
Hay or Grass Silage	10200	102.0	8500	85.0		
Pastured Cropland	4774	47.7	4774	47.7	-	
Other Field Crops	2930	81.1	2542	287.9	2500	375.0
Vegetables	19721	430.9	19721	1103.0	19721	433.7
Orchards					212	.,,,,,
Berries	77	7.6	69	8.7	77	7.8
Nursery, Greenhouse Other Crops						7.0
Totals		1452.0	43277	1639+7	22298	816.5
Total Herbicides, In	secticide	s, Fungic	ides: 10	00 lbs	135499	3908.2

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	13550	1882	1818	3700
1969	8944	1359	1418	2777
1972	6500	1400	1450	2850
Wet Manua	re Factor: To	ons per litter fa	arrowed	7.23
	re Defecated:			20606
Nutrients	in Wet Manus	re: Nitrogen, to	ons	103
		Phosphorus,	tons	29

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	30238	14928	15310			
1969	26216	11793	14423			
1972	27500	12000	15500			
Wet Manure Per Anima		13.14	6.45			
Wet Manure Defecated: Tons, 1972		157680	99975			
		ogen, tons	257655 1443			
Phosphorus, tons_			258			
	Potas	sh, tons	1288			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year .Item	Sheep & Lambs	Horses & Ponies
1964	994	
1969	7.80	372
1972	700	200
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1127	2556
Nutrients in Wet Manure: Nitrogen, Tons	16	18
Phosphorus, Tons	2	3
Potash, Tons	11	16

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Ite	m Chicken	Turkey Hens	Turkeys Raised
1964	69518		
1969	40570		
1972	53000	222	
Wet Manure Factor: Lbs. pe	er bird 82.9		
Wet Manure Defecated: Tons	3, 1972 2197		
Nutrients in Wet Manure: Nitrogen,	tons 34	Combined	
Phosphorus			
Potash, to	ons 8		

TABLE 6-- CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 401472	Number I-V farms 661
Number of farms	983	Acres in I-V farms 168183
Acres in farms	211650	Cropland I-V farms   13421
Cropland in farms	136205	Harvested cropland
Harvested cropland in fa	rms 90313	I-V farms 82267

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	25206	3181	652	3833
GRAINS	10297	701	9	710
Wheat	79	7	0	7
Oats	9212	651	7	658
Barley	10	0	0	0
Rye	938	41	2	43
OTHER FIELD CROPS	2128	891	96	987
Soybeans	606	63	1	64
Potatoes	1512	825	95	920
Sugar beets				
Field beans	1681	12	0	12
HAY OR GRASS SILAGE	24213	560	0	560
PASTURED CROPLAND	14847	77	4	81
Cropland used for pasture	13685	66	14	7.0
Improved pasture	1162	11	0	11
VEGETABLES, SWEET CORN, MELONS	19721	3 545	241	3786
ORCHARDS	1	0	0	0
BERRIES	76	20	4	24
NURSERY & GREENHOUSE PRODUCTS	61	10	0	10
OTHER CROPS	30	2	0	2
Total Fertilizer Used, Tons		8999	1006	10005
Percant of Fertilizer Used		90	10	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

TABLE /FERTILIZER			APPLIED	MESTONE EQUIV	
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	12586	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	2952	1070			
Total	15538	1972			14003
Primary Nutrients in		Ton	nages for Oth	er Recent Yea	rs
Fertilizer	8080				
Nitrogen	2101				
Phosphorus	2262				
Potash	3.717				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	1431	
Total Est:	imated Tons Applied on All outed 2076	

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-TOTOG

Table 1 1452.0	-	ecticides	Fungicides 816.5	Total 3908.2
Manure: Kind of	Tons	of Materials	in Wet Manure D	
Livestock	Manure		Phosphorus	Potash
Swine: Table 2	20606	103	29	78
Cattle: Table 3	257655	1443	258	1288
Sheep: Table 4	1127	16	2	11
Horses: Table 4	2556	18	3	15
Chickens: Table 5	2197	34	9	15
Turkeys: Table 5	mme.			
Total from Livestock, Tons	28414	1614	301	1400
Fertilizers:	Tons of	Commercial Fer	tilizers Applie	d
	-		ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potasi
Applied on Cropland: Table 7	15538	2101	2262	3717
Lime: Limestone equiva Table 8	lent purcha	sed or applied	, tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin

PLANNING SUBAREA: Northwest 2.1

COUNTY: Winnebago

Crop Group or Crops	Herbicides		Insecticides		Fungicides	
	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	45810	1259.7	10180	152.7		
Grains	16406	82.0	5469	54.6		
Hay or Grass Silage	14850	148.5	12375	123.7		
Pastured Cropland	4274	42.7	4274	42.7		
Other Field Crops	4445	89.3	325	8.4	50	7.5
Vegetables	6288	137.4	6288	351.7	6288	141.5
Orchards						
Berries	77	3.8	84	7.9	85	17.5
Nursery, Greenhouse						
Other Crops						
Totals Total Herbicides, In	92150	1763.4	38995	741.7	137568	166.5

	Hog & Pig	Number Sows Farrowing		& Pig Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total		
1964	17076	2167	1975	4142		
1969	11784	1416	1270	2686		
1972	10000	1800	1900	3700		
	1000000	ons per litter f		7.23		
et Manu	re Defecated:	Tons, 1972		26751		

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves
1964	56505	29740	26765
1969	47101	24053	23048
1972	49000	24500	24500
Wet Manure Per Anim		13.14	6.45
Wet Manure Tons, 19	Defecated:	321930	158025
	Defecated: Tons, I		479955 2688
Mutitents		osphorus, tons	480
		tash, tons	2400

Year Item	Sheep & Lambs	Horses & Ponies
1964	2504	
1969	1798	574
1972	1400	600
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2254	7668
Nutrients in Wet Manure: Nitrogen, Tons	32	53
Phosphorus, Tons	5	8
Potash Tons	23	46

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		160055		
1969		128932		
1972		161000		244
Wet Manure Facto	or: Lbs. per bird	82.9		
Wet Manure Defea	ated: Tons, 1972	6673		
Nutrients in Wet	rients in Wet Manure: Nitrogen, tons		Combined	
	Phosphorus, tons	2.7		
	Potash, tons	23		

TABLE 6-CROP ACREAGES & FERTILIZER US	EDCLASS I-V CENSUS FARMS, 1969
COUNTY, land area, acres (1)286912 Number of farms 1349	Number I-V farms 1015 Acres in I-V farms 175817
Acres in farms 199055	Cropland I-V farms   14223
Cropland in farms   58768 Harvested cropland in farms   21119	Harvested cropland I-V farms   112246

	Crop	Tons o	of Fertilizer	Used
Crops	Acres	Dry	Liquid	Tota
CORN	36947	4619	861	5480
GRAINS	24159	1153	10	1163
Wheat	857	26	0	26
Oats	22545	1054	10	1064
Barley	516	70	0	70
Rye	30	0	0	0
OTHER FIELD CROPS	5066	254	0	254
Soybeans	4967	240	0	240
Potatoes	43	9	0	9
Sugar beets				-
Field beans	461	0	0	0
HAY OR GRASS SILAGE	40782	73.5	0	735
PASTURED CROPLAND	16213	35	0	35
Cropland used for pasture	15056	33	0	33
Improved pasture	1157	2	0	
VEGETABLES, SWEET CORN, MELONS	6288	775	96	871
ORCHARDS	98	5	0	5
BERRIES	6	2	0	
NURSERY & GREENHOUSE PRODUCTS	125	22	0	22
OTHER CROPS	99	10	0	10
Total Fertilizer Used, Tons		7610	967	8577
Percent of Fertilizer Used		89	11	100

TABLE 7FERTILIZER	USED IN 1972	TABLE	APPLIED	MESTONE EQUIV	ALIGNA	
Item	Tons	Tonnage		Tonnage not		
Fertilizer Used on Crops: Solid	10789	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	2531	1972			2886	
Total	13320		mages for Oth	er Recent Yes		
Primary Nutrients in Fertilizer	6927	100	mages for our	The contract of the contract o		
Nitrogen	1801					
Phosphorus	1940					
Potash	3186					

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	3824 ted Tons Applied on All Hi	

Chemicals:	Hun	dredweight	Applied on Cro	pland	
	Herbicide	s Ins	ecticides	Fungicides	Total
Table 1	1763.4	741	.7	166.5	2671.6
Manure: Ki	nd of	Tons	of Materials	in Wet Manure D	efecated
Livestoc		Manure	Nitrogen	Phosphorus	Potash
Swine: Tab		26751	134	37	102
Cattle: Table 3		479955	2688	480	2400
Sheep: Table 4		2254	32	5 8	23
Horses: Table 4 Chickens: Table 5 Turkeys: Table 5		7668	53		46
		6673	104	27	23
Total from Ton	Livestock,	523301	3011	557	2594
Fertilizers	1	Tons of	Commercial Fer	tilizers Applie	d
TO LEAD TO SE			Prima	ry Nutrients	11- 11-
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	13320	1801	1940	3186
	stone equiva	lent purcha	ased or applied	, tons:	2886

To Convert From
Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan

PLANNING SUBAREA: Northwest 2.1 COUNTY: Dickinson

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	1000					
Grains	1086	5.4	362	3.6		
Hay or Grass Silage	1843	18.4	1536	15.3		
Pastured Cropland	1216	12.1	1216	12.1		
Other Field Crops	1188	35.6	1320	151.8	1320	198.0
Vegetables		-				
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	5333	71.5	4434	182.8	1320	198.0
Total Herbicides, In	secticide	s. Funcic	ides: 10	0 The	11087	452 2

## TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	213	16	23	39
1969	19	5	-4	9
1972	20	5	4	9
Wet Manur	e Defecated:			7.23
Nutrients	in Wet Manu	re: Nitrogen, to		0
		Phosphorus,	tons	0

## TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	4758	2515	2243			
1969	3880	2202	1678			
1972	4200	2400	1800			
Wet Manure F Per Animal	actor: Tons	13.14	6.45			
Wet Manure I Tons, 1972		31536	11610			
	Defecated: Tons, 19		43146			
Nutrients in	Wet Manure: Nitr		242			
		phorus, tons	43			
	Pota	sh, tons	216			

### TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep &	Horses & Ponies
1691 Team	Lamps	ronies
1964	62	
1969	4	90
1972	0	445
Wet Manure Factor: Tons per animal		12.78
Wet Manure Defecated: Tons, 1972	***	5687
Nutrients in Wet Manure: Nitrogen, Tons		39
Phosphorus, Tons		6
Potash, Tons		34

## TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey	Turkeys Raised
1964	3850		
1969	1865		
1972	2000		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	83		
Nutrients in Wet Manure: Nitrogen, tons	1	Combined	
Phosphorus, tons	0		
Potash, tons	0		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres_	(1) 484608	Number I-V farms 90	
Number of farms	162	Acres in I-V farms 28967	
Acres in farms	39749	Cropland I-V farms 13662	
Cropland in farms	17705	Harvested cropland	
Harvested cropland in far	rms 10248	I-V farms 8859	

	Crop	Tons o	f Fertilizer	Used
Crops	Acres	Dry	Liquid	Total
CORN	632	83	0	83
GRAINS	1601	132	2	134
Wheat	1466	113	2	115
Oats	89	14	0	14
Barley	46	5	0	5
Rye				
OTHER FIELD CROPS	1320	763	30	793
Soybeans				
Potatoes	1320	763	30	793
Sugar beets				
Field beans	10	0	0	0
HAY OR GRASS SILAGE	50.56	54	0	54
PASTURED CROPLAND	3228	57	0	57
Cropland used for pasture	2984	55	0	55
Improved pasture	244	2	0	2
VEGETABLES, SWEET CORN, MELONS	109	28	0	28
ORCHARDS	5	0	0	0
BERRIES	12	0	0	0
NURSERY & GREENHOUSE PRODUCTS				
OTHER CROPS				
Total Fertilizer Used, Tons		1117	32	1149
Percent of Fertilizer Used		97	3	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

INDIE /PERILIPEER		APPLIED APPLIED					
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	1545	Year	Government Cost/Shared	Cost/Shared	Total Tonnage		
Liquid	294	1972	391	0	201		
Total	1839		2 391 0 391 onnages for Other Recent Years				
Primary Nutrients in		Ton	nages for Uth	er Kecent lea	ITS		
Fertilizer	901	-			-		
Nitrogen	297						
Phosphorus	288						
Potash	316						

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2403	34.1
1971-72	3061	43.7
1972-73	3980	53.3

#### TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	22 12 12 12 12 12 12 12 12 12 12 12 12 1	-			2000000000
	Herbicides		cticides	Fungicides	Total
Table 1	71.5	183	2.8	198.0	452.3
Manure: Ki	nd of	Tons	of Materials	in Wet Manure De	fecated
Livestoc	k	Manure	Nitrogen	Phosphorus	Potash
Swine: Tab	le 2	65		0	0
Cattle: Ta	ble 3	43146	242	43	216
Sheep: Tab	le 4	0	0	0	0
Horses: Ta	ble 4	5687	39	6	34
Chickens:	Table 5	83		0	0
Turkeys: T	able 5	0	0	0	0
Total from Ton	STATE OF THE PARTY	48981	283	49	250
Fertilizers	:	Tons of C		rtilizers Applied	
Ite	m	Total	Prima Nitrogen	Phosphorus	Potasi
Annilded on	Coorlands				

Applied on Cropland: Table 7	1839	297	288	316
Lime: Limestone equi Table 8	valent purch	ased or applied	d, tons:	391
Salts: Applied on al	l highways,	tons: Table 9		5773

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To
Kilograms(kg)
Hectare (ha)
Kilograms (kg)

Multiply By 0.453 .4047 907.2

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan

PLANNING SUBAREA: Northwest 2.1 COUNTY: Iron

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	
Corn		***		HAM:			
Grains	600	3.0	200	2.0			
Hay or Grass Silage	1114	11.1	928	9.2	-		
Pastured Cropland	601	6.0	601	6.0			
Other Field Crops	422	12.6	469	53 - 9	469	70.3	
Vegetables						- Charles	
Orchards							
Berries							
Nursery, Greenhouse						1000	
Other Crops							
Totals	2737	32.7	2198	71.1	469	70.3	

TABLE 2--MANURE FROM SWINE

Hog & Pig	Number Sows Farrowing		
Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
23	1	2	3
69	5	6	11
65	5	6	-11
	Dec. 1 23 69	Dec. 1 Spring 23   69 5	Dec. 1 Spring Fall  23 1 2 69 5 6

TABLE 3-MANURE FROM CATTLE

		Number Cattle	Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	3839	1949	1890				
1969	2373	1139	1234				
1972	2600	1200	1400				
Wet Manure   Per Animal	Factor: Tons	13.14	6.45				
Wet Manure I Tons, 1972		15768	9030				
Wet Manure I	Defecated: Tons, 19	972 Combined:	24798				
	Wet Manure: Niti		139				
	Phos	sphorus, tons	25				
	Pot	ash, tons	124				

TABLE 4--MANURE FROM SHEEP AND HORSES

	Sheep &	Horses &
Year Item	Lambs	Ponies
1964	6	
1969	0	7.0
1972	0	438
Wet Manure Factor: Tons per animal	0	12.78
Wet Manure Defecated: Tons, 1972	0	5598
Nutrients in Wet Manure: Nitrogen, Tons	0	39
Phosphorus, Tons	0	6
Potash, Tons	0	34

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	9971		
1969	5768		12000
1972	6300		
Wet Manure Factor: Lbs. per bird	82.9		
wet Manure Defecated: Tons 1972	261		Lulini
Nutrients in Wet Manure: Nitrogen, tons	4	Combined	
Phosphorus, tons Potash, tons			

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	749440	Number I-V farms	56
Number of farms	106	Acres in I-V farms	19343
Acres in farms	27283	Cropland I-V farms	7422
Cropland in farms	10098	Harvested cropland	
Harvested cropland in farms	5623	I-V farms	4427

	Crop	Tons o	f Fertilizer Used		
Crops	Acres	Dry	Liquid	Total	
CORN	18	14	0	4	
GRAINS	1153	111	0	111	
Wheat	0			1 5 5	
Oats	1094	103	0.	103	
Barley	42	8	0	8	
Rye	17	0	0	0	
OTHER FIELD CROPS	469	321	0	321	
Soybeans	-				
Potatoes	469	321	0	321	
Sugar beets					
Field beans	174	3	0	3	
HAY OR GRASS SILAGE	2638	31	0	31	
PASTURED CROPLAND	1706	1.2	(4.44.44)	12	
Cropland used for pasture	1454	9	0	9	
Improved pasture	252	3	0	3	
VEGETABLES, SWEET CORN, MELONS	- 1	0	0	0	
ORCHARDS					
BERRIES					
NURSERY & GREENHOUSE PRODUCTS				THE COLUMN	
OTHER CROPS			0		
Total Fertilizer Used, Tons		482	0	482	
Percent of Fertilizer Used		100	0	100	

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

000 44 4774	ASSOCIA	APPLIE
Tons		Tonnage
648	Year	Cost/Share
123	1072	910
771		nages for
378	Jon	nages for
125		
121		
132		
	Tons  648 123 771 378 125 121	Tons  648 123 771 1972 Ton 378 125 121

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
1972	910	0	910
Ton	mages for Oth	er Recent Yea	rs

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year Tons Purchased Through State		Tons Applied Per "E" Mile	
1970-71	2288	22.2	
1971-72 2403		23.4	
1972-73	3286	29.4	
Total Esti	mated Tons Applied on All Hi	ghways in 1972-73,	

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	secticides	Fungicides	Total	
Table 1 32.7			71.1	70.3	174.1	
Manure: Kind of Livestock		Tons of Materials		in Wet Manure Defecated		
		Manure	e Nitrogen	Phosphorus	Potash	
Swine: Tab	le 2	80		0	0	
Cattle: Ta		24798	139	25	124	
Sheep: Tab		0	0	0	0	
Horses: Ta		5598	39	6	34	
Chickens: Table 5		261	4		1	
Turkeys: Table 5		0	0	0	0	
Total from Livestock, Tons		30737	183	32	159	
Fertilizers		Tons of	Commercial Fer	rtilizers Applied		
Letellisers		Primary Nutrients				
Ite	m	Total	Nitrogen	Phosphorus	Potash	
Applied on Table 7	Cropland:	771	125	121	132	
Lime: Lime Tabl		nt purch	ased or applied	d, tons:	910	

To Convert From

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds	

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan PLANNING SUBAREA: Northwest 2.1 COUNTY: Menominee

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn			222	(0.40		
Grains	6546	32.7	2182	21.8		
Hay or Grass Silage	9058	90.5	7548	75.4		
Pastured Cropland	4253	42.5	4253	42.5		
Other Field Crops	61	1.8	61	7.0	61	9.1
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse Other Crops						
Totals	19918	167.5	14044	146.7	61	9.1

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	Total
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	
1964	431	33	52	85
1969	385	113	107	220
1972	400	100	100	200
et Manu	re Factor: To	ons per litter fa	arrowed	7.23
	re Defecated:			1446
let Manu				
		re: Nitrogen, to	ons	7
		re: Nitrogen, to Phosphorus,		7 2

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	23894	12706	11188		
1969	19458	10322	9136		
1972	21300	11200	10100		
Wet Manure Per Anima	Pactor: Tons	13,14	6.45		
Wet Manure Tons, 197		147168	65145		
	Defecated: Tons, 1972		212313		
Nutrients i	n Wet Manure: Nitroge		1189		
		rus, tons	212		
	Potash,	tons	1062		

Year Item	Sheep & Lambs	Horses & Ponies
1964	233	
1969	59	218
1972	50	1066
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	81	13623
Nutrients in Wet Manure: Nitrogen, Tons	1	94
Phosphorus, Tons	0	14
Potash, Tons	0	82

#### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		32164		
1969		24337		
1972		26700		
	r: Lbs. per bird	82.9		
Wet Manure Defec	ated: Tons, 1972	1107		
Nutrients in Wet Manure: Nitrogen, tons		17	Combined	ED.
	Phosphorus, tons	4		
	Potash, tons	4		

TABLE 6-- CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	664256	Number I-V farms 395
Number of farms	588	Acres in I-V farms 124701
Acres in farms	162239	Cropland I-V farms 57475
Cropland in farms	69744	Harvested cropland
Harvested cropland in far	ms 45393	I-V farms 40462

	Crop	Tons o	f Fertilize	r Used	
Crops	Acres	Dry	Liquid	Total	
CORN	4398	657	0	6.57	
GRAINS	9696	1042	0	1042	
Wheat	56	3	0	3	
Oats	8767	919	0	919	
Barley	855 18	119	0	119	
Rye	18	2	0	2	
OTHER FIELD CROPS	68	27	2	29	
Soybeans					
Potatoes	68	27	2	29	
Sugar beets					
Field beans	35	0	0	0	
HAY OR GRASS SILAGE	26605	554	3	557	
PASTURED CROPLAND	12968	227	0	227	
Cropland used for pasture	12578	225	0	225	
Improved pasture	390	2	0	2	
VEGETABLES, SWEET CORN, MELONS					
ORCHARDS	5	0	0	0	
BERRIES		1			
NURSERY & GREENHOUSE PRODUCTS	5	0	2	2	
OTHER CROPS	65	8	0	8	
Total Fertilizer Used, Tons		2515	7	2522	
Percent of Fertilizer Used		100	0	100	

JSED IN 1972	TABLE	The second secon	MESTONE EQUIV	ALENT
Tons			Tonnage not	
3389	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
646	1072	326	25	351
4035				
	101	mages for oth	L WECEHT 169	1.0
1977				
652	-			
633				
692				
	3389 646 4035 1977 652 633	Tons  3389 646 4035 1977 652 633	Tons APPLIED Tonnage Government Year Cost/Shared 1972 326 Tonnages for Oth 1977 652 633	Tons

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Through State	"E" Mile
1638	14.7
1705	15,4
1784	15.1
Tons Applied on All Hi	ghways in 1972-73,
	1638 1705 1784

	Herbicides	Ins	ecticides	Fungicides	Total
Table 1	167.51	11	46.7	9.1	323.3
Manure: Kind of		Tons	of Material	s in Wet Manure I	efecated
Livesto	ck	Manure	Nitroge	n Phosphorus	Potash
Swine: Tal	ole 2	1446	23	6	5
Cattle: T	able 3	212313	1189	212	1062
Sheep: Tal	ole 4	81		0	0
Horses: Ta	able 4	13623	94 14		82
Chickens:	Table 5	1107	17	- 4	4
Turkeys:	Table 5	757		244	
Total from To:	Livestock,	228570	1324	236	11.53
Fertilizer	9:	Tons of		Pertilizers Applie	d
			Pri	mary Nutrients	
Ite	174	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	4035	652	633	692
	estone equival le 8	ent purcha	sed or appli	led, tons:	351
	plied on all h	iohwaya r	ons: Table	q	2587

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

### 5.3 Planning Subarea 2.2

Planning Subarea 2.2 includes a total of 17 counties in Illinois, Indiana, and Wisconsin. Total land area equals 2,122,600 hectares (5,244,864 acres), with lands in farms equalling 1,221,300 hectares (3,017,892 acres) or about 55 percent of the total land area. Twenty-three percent of the land area in this planning subarea is devoted to urban uses.

# 5.3.1 Agricultural Characteristics

Most of the cropland in this planning subarea is used for corn, soybeans and hay or silage. Nursery and greenhouse products are also important due to the large urban population.

Table 5-30 indicates the relative proportions of materials usage in PSA 2.2 as compared to the total Great Lakes Basin.

Table 5-30

MATERIALS USAGE BASIN RELATIONSHIP -- PSA 2.2 TO GREAT LAKES

Per harvested acre of cropland	Planning Subarea 2.	2 Great Lakes Basin
Lbs of chemicals applied Index of chemicals used	2.21 83	2.66 100
Tons of livestock manure defecated Index of manure defecated	2.70	3.37 100
Lbs primary nutrients in livestock man Index of primary nutrients in manure	ure 66 80	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	347 37 108	321 22 100
Lbs primary nutrients in commercial fe Index primary nutrients in commercial f	rtilizer 167 ertilizer 109	153 100
Lbs of lime applied Index of lime used	229 135	170 100
Per acre of total land area		
Lbs road salts used Index road salts used	121.99 292	41.74 100
To Convert From To Kilogra Kilogra (ton) Kilogra Metric	ms (kg) ms (kg)	Multiply By 0.454 907.2 0.907

## 5.3.2 Materials Usage

The following table lists by county the materials usage inventory for PSA 2.2.

Table 5-31
MATERIALS USAGE
(in 1972)

	Chemicals Applied	Livestock	Commercial Fertilizer	Limestone Purchased	Salts Applied to
PSA 2.2	to Crops (100 lbs)	Manure (tons)	on Croplands (tons)	or Applied (tons)	all Highways (tons)
Illinois					
Cook	1387	152435	20315	4135	114495
Du Page	899	59380	8719	2926	10588
Kane	4114	684426	28892	29120	7745
Lake	1249	264826	6813	1844	21024
McHenry	4149	769863	27277	21160	6179
Will	5866	455059	30754	56750	18130
Indiana					
Lake	2798	195889	19608	14022	28496
LaPorte	4817	295107	44602	38108	11297
Porter	2534	184506	30673	17919	10594
Starke	2287	105599	36763	14158	5794
Wisconsin					
Kenosha	1796	234233	12377	3258	5886
Milwaukee	268	19186	1008	6	40861
Ozaukee	1684	253274	7501	783	2038
Racine	2153	239902	16122	3329	6377
Walworth	4499	599690	33402	17512	6620
Washington	2121	512837	11888	1332	9776
Waukesha	1767	407481	12194	3757	14012
TOTAL	44388	5433693	348908	230117	319912
To Convert Fi	rom	То		Asserting and Asserting and Asserting	ply By
Pounds (1b)		Kilogram	s (kg)	0.4	54
Tons (ton)		Kilogram	s (kg)	907.2	
		Metric To	ons	0.9	07

# 5.3.2.1 Agricultural Chemicals

There were 2,013,400 kilograms (4,438,800 pounds) of agricultural chemicals used in Planning Subarea 2.2 in 1972. Herbicides represented 77 percent of the total, insecticides 18 percent, and fungicides 5 percent. Herbicide use may increase about 10-25 percent in the next 10 years and fungicide use about 5-15 percent. Insecticide use on grain and forage crops may increase 30-40 percent in the next 5 years, but decrease to about present levels within 10 years.

#### 5.3.2.2 Animal Wastes

There were about 173,341 head of cows and heifers calved, and 286,836 head of cattle in 1972. Cattle defecates 76 percent of the manure, horses 13, swine 8, chickens 2 and sheep 1 percent. Approximately 4,929,446 metric tons (5,433,693 tons) of wet manure are produced from all livestock in PSA 2.2. One reason that the manure index is relatively low for the subarea is that cow numbers are less, and numbers of other kinds of livestock, especially hogs and feeding cattle, are greater, in relation to the other planning subareas.

Livestock numbers are expected to remain at about the same levels over the next ten years. Manure production will correspond in level.

### 5.3.2.3 Commercial Fertilizers

Currently a total of 316,529 metric tons (348,908 tons) of commercial fertilizers are applied to croplands in Planning Subarea 2.2. This represents 30 percent of the total amount of commercial fertilizers applied in the Lake Michigan basin. Primary nutrients account for 152,420 metric tons (168,048 tons), or 48 percent of the total amount applied in PSA 2.2. Nitrogen represents 36 percent of the primary nutrients applied, phosphorus 27 percent, and potash 37 percent.

Commercial fertilizer usage will continue to increase in this subarea because of the high value of crop production per acre, justifying even greater quantities than now used. The percent applied in liquid form, already the highest of any subarea in the Great Lakes Basin, will increase modestly in the next decade.

## 5.3.2.4 Lime

A total of 208,762 metric tons (230,117 tons) of lime was purchased or applied to croplands in PSA 2.2 in 1972. This represents 33 percent of the total amount of limestone applied in the Lake Michigan basin. Based on present usage rates, liming rates will remain relatively unchanged. They may decrease slightly as forages assume less overall significance in crop production areas.

## 5.3.2.5 Salts

At the present time about 290,224 metric tons (319,912 tons) of road de-icing salts are applied to highways in PSA 2.2. This accounts for 48 percent of all salts applied in the Lake Michigan basin. This is due to the urban areas and the demand for a "dry-pavement" policy in those areas. Road de-icing salts will increase about in proportion to road mileage increases. There will be changes and improvements in usage; however, application rates are not likely to increase.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Illinois, Indiana, and Wisconsin

PLANNING SUBAREA: Southwest 2.2

COUNTY: 17 County Totals

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	844896	23234.2	187755	2816.2		
Grains	118569	592 1	39523	394.9		
Hay or Grass Silage	91860	918.6	76550	765.1		
Pastured Cropland	43526	434.4	43526	434.4		
Other Field Crops	393160	7895.4	27970	657.3	3600	540.0
Vegetables	112661	1012.6	1126611	2521.6	1,2661	10571.7
Orchards			The second second	92500110000		- 1020 - N
Berries	2805	1.63.3	2929	307.9	2995	645.6
Nursery, Greenhouse						
Other Crops						
					V.2004	2239.7
Totals Total Herbicides, In	1537480	31250.9		7897.h	1,9259	

TARIF	2MANURE	FROM	SWINE

	Hog & Pig	Number Sows Farrowing		Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total		
1964	343686	34721	29707	611128		
1969	280750	26851	2/1721	51572		
1972	277595	27594	30939	58533		

TABLE	3-MANURE	FROM	CATTLE
20,0000 00000	The second second		

		Number Cattle and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves	
1964	5h2h19	23871/18	304271	
1969	430881	186621	2111260	
1972	460177	173341	286836	
Wet Manure H Per Animal	actor: Tons	13.14	6.45	
Wet Manure I		2277701	1850092	
	Defecated: Tons, 1972 Wet Manure: Nitros Phospi	gen, tons 23	27793 116 28	

### TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	39800 28750	a doub
1969 1972	28750	15074 57161
	1.61	2000000
Wet Manure Factor: Tons per animal Wet Manure Defecated: Tons, 1972	37568	12.78 730518
Nutrients in Wet Manure: Nitrogen, Tons	526	5041
Phosphorus, Tons Potash, Tons	79 376	730 Ji383

#### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		181/7151		
1969		2431565		
1972		2636101	4090	40900
Wet Manure Fac	tor: Lbs. per bird	82.9	365.0	89.63
Wet Manure Def	ecated: Tons, 1972	109266		
Nutrients in W	et Manure: Nitrogen, tons	1705	Combined 2	570
	Phosphorus, tons Potash, tons	1438 382	1 1	0

## TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	1) 521/1861	Number I-V farms	12344
Number of farms	17027	Acres in I-V farms	2750836
Acres in farms	3017892	Cropland I-V farms	2338128
Cropland in farms	2463742	Harvested cropland	
Harvested cropland in farm	ns 2009410	I-V farms	1863065

	Crop	Tons o	of Fertilizer Used		
Crops	Acres	Dry	Liquid	Total	
CORN	875899	112342	56994	169336	
GRAINS	245774	15205	1990	17435	
Wheat	76358	7626	11129	9045	
Oats	157641	6997	557	7554	
Barley	9177	682	8	690	
Rye	1851	109	3	115	
OTHER FIELD CROPS	431838	17061	2369	19430	
Soybeans	418891	12738	2038	11,776	
Potatoes	6507	3013	54	3067	
Sugar beets					
Field beans	2378	32	20	52	
HAY OR GRASS SILAGE	262211	6576	229	6805	
PASTURED CROPLAND	178947	2716	225	29/17	
Cropland used for pasture	149813	1898	209	2107	
Improved pasture	29134	818	16	834	
VEGETABLES, SWEET CORN, MELONS	45362	10969	860	11829	
ORCHARDS	2918	364	18	382	
BERRIES	666	137	2	139	
NURSERY & GREENHOUSE PRODUCTS	11276	3727	2148	3975	
OTHER CROPS	1211	39	7	16	
Total Fertilizer Used, Tons		169408	62962	232370	
Percent of Fertilizer Used		73	27	100	

## TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

		100000000	APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	221335	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	127573	1972			230117
Total	348908	Tonnages for Other Recent Years			
Primary Nutrients in Fertilizer	168048	101	mages for oth	I IIC COLLE VOI	
Nitrogen	60938				
Phosphorus	45217				
Potash	61903				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	220567	
1972-73 Total Estima	220567 ted Tons Applied on All Hi	Ighways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicid	es In	secticides	Fungicides	Total	
Table 1	34250.9	7897.4		2239.7	111388.0	
Manure: Kin	nd of	Ton	s of Materia	ls in Wet Manure	Defecated	
Livestoc	K	Manur	e Nitroge	en Phosphorus	Potash	
Swine: Tab	le 2	1,25978	2132	596	1620	
Cattle: Tal	ble 3	4127793	23116	1,128	20639	
Sheep: Tab.	le 4	37568	526	79	376	
Horses: Tal	ble 4	730518	5041	730	1,383	
Chickens:	Table 5	109266	1705	438	382	
Turkeys: T	able 5	2570	40	10	9	
Total from Ton	Control of the Contro	ivestock, 5433693 32560		5981	27409	
Fertilizers	:	Tons of	Commercial	Fertilizers Appl	ied	
			Pr	Primary Nutrients		
Ite	in	Total	Nitrogen	Phosphorus	Potash	
Applied on Table 7	Cropland:	348908	60938	45217	61903	

Lime: Limestone equivalent purchased or applied, tons: Table 8 230120

Salts: Applied on all highways, tons: Table 9 319912

To Convert From
Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

PLANNING AREA:	Lake Michigan 2.0	STATE:	Wisconsin
DE ANDIENO COMANDA.	Courthment 2.2	OO VINTERS	Vanneha

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs		Amount Used 100 1bs	Acres Treated	
Corn	27630	759.8	6140	92.1		
Grains	5046	25.2	1682	16.8		
Hay or Grass Silage	5580	55.8	4650	46.5		
Pastured Cropland	2043	20.4	2043	20.4		
Other Field Crops	8945	188.3	1550	125.7	1050	157.5
Vegetables	1735	37.9	1735	97.0	1735	39.0
Orchards						1000
Berries	319	22.0	329	34.0	342	57.6
Nursery, Greenhouse						
Other Crops						
Totals	51298	1109.4	70700	432.5	3127	25h.1

	Hog & Pig	Number Son	s Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	9015	968	756	1724
1969	8077	968 798	796	1594
1972	7500	600	600	1200

		Number Cattle	er Cattle and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves		
1964	20987	11972	9015		
1969	18199	10122	8077		
1972	22500	9500	13000		
Wet Manure Per Anima	Factor: Tons	13.14	6.45		
Wet Manure Tons, 197		124830	83850		
	Defecated: Tons, 1972 n Wet Manure: Nitroge Phospho Potash,	orus, tons 116	9		

Year Item	Sheep & Lambs	Horses & Ponies
1964	1970	
1969	1276	1479
1972	1000	600
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1610	7668
Nutrients in Wet Manure: Nitrogen, Tons	23	53
Phosphorus, Tons	3	8
Potash, Tons	16	46

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		94681		
1969		12006h		
1972		153000	2000	20000
Wet Manure Factor	: Lbs. per bird	82.9	365	89.63
wet Manure Defeca	ted: Tons 1972	6342		- Allen
Nutrients in Wet	Manure: Nitrogen, tons	99	Combined	1257
	Phosphorus, tons	25		5
	Potash, tons	22		4

COUNTY, land area, acres         1712           Number of farms         699           Acres in farms         1087           Cropland in farms         875h	Acr Cro 8 Har	Acres in I-V farms 98137 5 Cropland I-V farms 80226 Harvested cropland			
Harvested cropland in farms 6651	8	I-V	farms 628	40	
	Crop	p Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total	
CORN	25649	3792 843	911	4733	
GRAINS	10904	843		851	
Wheat	2112	209	5	851 211 508	
Oats	7593	502	6	508	
Barley	1137	124	0	124	
Rye	0	0	0	0	
OTHER FIELD CROPS	9027	1087	10	1097	
Soybeans	7623	1435 581	5	1440	
Potatoes	1116	581	5	586	
Sugar beets					
Field beans					
HAY OR GRASS SILAGE	15863	1472	21	493	
PASTURED CROPLAND	8057	37	0'	37	
Cropland used for pasture	71.84	33	0	33	
Improved pasture	873	14	0	4	
VEGETABLES, SWEET CORN, MELONS	1735	638	3	493 37 33 4 641 63 30	
ORCHARDS	256	63		63	
BERRIES	256 135	30	0	30	
NURSERY & GREENHOUSE PRODUCTS	52 67	23	0	23	
OTHER CROPS	67	2	0		
Total Fertilizer Used, Tons		6987	983	7970	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

		-	APPLIED				
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	10025	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	2352	1972			3258		
Total	12377		nages for Oth	er Recent Yes			
Primary Nutrients in Fertilizer	6436	100	Hages Ave ven				
Nitrogen	1673						
Phosphorus	1802						
Potash	2961						

Percant of Fertilizer Used

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	4058 ited Tons Applied on All Hi	

	Herbicides	The	secticides	Fungicides	Total
Table 1	1109.4		2.5	254.1	1796.0
Manure: Kir	ad of	Tons	of Materials	in Wet Manure D	efecated
Livestock		Manure		Phosphorus	Potash
Swine: Tabl		8676	143	12	33
Cattle: Tab		208680	1169	209	1043
Sheep: Tabl		1610	23	3	16
Horses: Tal		7668	53	8	46
Chickens:		6342	99	25	22
Turkeys: Ta		1257	20	5	14
Total from Livestock,		234233	1407	262	1164
Fertilizers		Tons of	Commercial Fer	tilizers Applie	d
Telettranero				ry Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potasi
Applied on Table 7	Cropland:	12377	1673	1802	2961
	stone equival	ent purcha	ased or applied	, tons:	

To Convert From
Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime and	Highway De-Icing	Compounds
PLANNING AREA	Lake	e Michigan	2.0	STATE:	Wisconsin	

TARLE 1-ESTIMATE	D AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972

	Herbi	cides	Insecticides		Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	2070	56.9	1,60	6.9		
Grains	1.783	8.9	594	5.9		
Hay or Grass Silage	690	6.9	575	5.9 5.7		
Pastured Cropland	222	2.2	222	2.2		
Other Field Crops	1.615	33.3	150	6.7	50	7.5
Vegetables	1037	22.7	1037	58.0	1037	23.3
Orchards	-	10000				
Berries	61	11.7	62	6.6	65	10.0
Nursery, Greenhouse						
Other Crops						
Totals	7508	135.6	3100	92.0	1152	40.8
Total Herbicides, In	secticide	s. Fungio	ides: 10	0 lbs	11760	268.4

	Hog & Pig	Number So	ws Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	1951	112	116	228	
1969	1954 630	78	66	11/1	
1972	500	50	50	100	

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

# TARES 2 MANIED PROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	2338 1166	1223	1115			
1969	1166	612	554			
1972	1200	1,00	800			
Wet Manure I Per Animal	actor: Tons	13.14	6.45			
Wet Manure Defecated: Tons, 1972		5256	5160			
			16			

## TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	82	
1969	22	138
1972	22 25	138 500
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	40	6390
Nutrients in Wet Manure: Nitrogen, Tons	1	14/4
Phosphorus, Tons	0	6
Potash, Tons	0	38

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		22661		
1969		27852		
1972		39000		
Wet Manure Factor	: Lbs. per bird	82.9		
Wet Manure Defeca	ated: Tons, 1972	82.9 1617		
Nutrients in Wet	Manure: Nitrogen, tons	25	Combined	
	Phosphorus, tons	6		
	Potash, tons	_ 6		

#### PLANNING SUBAREA: Southwest 2.2 COUNTY: Milwaukee TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	757260	Number I-V farms	116
Number of farms	2/15	Acres in I-V far	ms 10941
Acres in farms	171/12	Cropland I-V far	
Cropland in farms	14069	Harvested cropla	
Harvested cropland in farms	9658	I-V far	ms 7006

	Crop	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total	
CORN	1116	127	24	151	
GRAINS	2070	135	0	135	
Wheat	723 1258	135 48 84	0	48	
Oats	1258	84	0	84	
Barley	89	14	0	14	
Rye	0				
OTHER FIELD CROPS	1214	67 144	0	67	
Soybeans	1172		0	144	
Potatoes	142	23	0	23	
Sugar beets					
Field beans					
HAY OR GRASS SILAGE	1/120	1	0	1	
PASTURED CROPLAND	386	3	0	3	
Cropland used for pasture	337	3	0	3	
Improved pasture	149	0	0		
VEGETABLES, SWEET CORN, MELONS	1037	239	0	239	
ORCHARDS	38	3	0	38	
BERRIES	34	12	0	12	
NURSERY & GREENHOUSE PRODUCTS	81	34	4	38	
OTHER CROPS	0				
Total Fertilizer Used, Tons		621	28	649	
Percent of Fertilizer Used		96	4	100	

# TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

ATOMIC / LOCAL PROPERTY			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	816	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	192	1972			6
Total	1008		mages for Oth	er Recent Yes	rs
Primary Nutrients in Fertilizer	524	100	mages for our	I I I DOUTE I I	
Nitrogen	136				-
Phosphorus	147				
Potash	2/17				

# TABLE 9-- SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	28172	
	ated Tons Applied on All F ted LO861	lighways in 1972-73,

### TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	secticides	Fungicides	Total
Table 1 135.6			92.0	40.8	268.4
Manure: Kir	nd of	Tons	of Materials	in Wet Manure D	
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Tabl	le 2	723	14	1	3
Cattle: Tak	ole 3	10416	58	10	52
Sheep: Table 4		40	1	0	0
Horses: Tal	orses: Table 4		111	6	38
Chickens:	ickens: Table 5		25	6	6
Turkeys: Ta	able 5				
Total from l	Livestock,	19186	132	23	99
Fertilizers		Tons of		rtilizers Applie	đ
				mary Nutrients	
Ite	TA .	Total	Nitrogen	Phosphorus	Potasi
Applied on Cropland: Table 7		1008	136	2147	2117

Table 8 6

Salts: Applied on all highways, tons: Table 9 40861

To Convert From Pounds (1b)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

STATE: Wisconsin PLANNING AREA: Lake Michigan 2.0 PLANNING SUBAREA: Southwest 2.2 COUNTY: Ozaukee

260.3

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	18090	497.4	4020	60.3		
Grains	8309	41.5	2770	27.7		
Hay or Grass Silage	7740	77.4	6450	64.5		-
Pastured Cropland	2016	20.1	2016	20.1		
Other Field Crops	980	21.4	250	23.5	200	30.0
Vegetables	6646	145.2	6646	371.7	6646	149.5
Orchards					-	- Constitution of the Cons
Berries	347	16.9	386	35.6	389	80.8
Nursery, Greenhouse				2017		-
Other Crops						

	Hog & Pig	Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	9121	1495	1556	3051
1969	8730	1085	1098	2183
1972	8000	1200	1200	2400

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons Potash, tons\_

 Totals
 hul28
 819.9
 22538
 603.4
 7235

 Total Herbicides, Insecticides, Fungicides:
 100 lbs
 7390

TABLE 3-MANUER FROM CATTLE

	Numl	Number Cattle and Calves		
Total			Heifers, Steers, Bulls, Calves	
26711	The	551	12160	
2/1013	121	500	11512	
24000	10	500	13500	
actor: Tons	13	.14	6.45	
Wet Manure Defecated: Tons, 1972		7970	87075	
		225 120 225		
	26711 2h012 2h000 actor: Tons efecated:	Total   Cows &   Ca	Cows & Heifers   Calved	

TABLE	4MANURE	FROM	SHEEP	AND	HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	770	
1969	1006 500	251 600
1972	500	600
Wet Manure Pactor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	805	7668
Nutrients in Wet Manure: Nitrogen, Tons	11	53
Phosphorus, Tons	2	8
Potash, Tons	8	46

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		65635		
1969		40218		
1972		58000		
Wet Manure Fac	tor: Lbs. per bird	82.9		
wet Manure Def	ecated: Tons, 1972	2404		
Nutrients in W	et Manure:		Combined	
	Nitrogen, tons	38		
	Phosphorus, tons	1.0		
	Potash, tons	8		

TABLE 6 CROP	ACREAGES	2	FERTILIZER.	HSED-CLASS	T-V	CENSUS	FARMS	1969

COUNTY, land area, acres (1)	150784	Number I-V farms	542
Number of farms	759	Acres in I-V farms	93224
Acres in farms	105037	Cropland I-V farms	77011
Cropland in farms	84941	Harvested cropland	
Harvested cropland in farms	69391	I-V farms	64296

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	17262	2088	1,64	2552
GRAINS	16097	547 55 458	3	552 55 463
Wheat	1230	55	0	55
Oats	14103	458	5	1463
Barley	314	11	0.	11
Rye	1 3	0	0	0
OTHER FIELD CROPS	430	133	.0	133
Soybeans	153	714	0	7)1
Potatoes	276	118	0	118
Sugar beets				-
Field beans	201	0	0	0
HAY OR GRASS SILAGE	23470	406	6.	11.2
PASTURED CROPLAND	7389	18	0	18
Cropland used for pasture	6999	16	0	16
Improved pasture	390	2	0	2
VEGETABLES, SWEET CORN, MELONS	6646	1027	60	1087
ORCHARDS	458	57	2	59
BERRIES	17	10	0	10
NURSERY & GREENHOUSE PRODUCTS	137	7	0	7
OTHER CROPS	0			
Total Fertilizer Used, Tons		4293	537	4830
Percent of Fertilizer Used		89	11	100

TERRITIZED HOED IN 1072 MARIE 0 CROIND I IMPOTONE FORTUNA ENT

TABLE /FERTILIZER	DSED IN 1972	TABLE	APPLIED	viupa anoicam	ALEMI
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	6076	Year	Government Cost/Shared	Cost/Shared	Total Tonnage
Liquid	1425	1972			783
Total	7501		nages for Oth	er Recent Yea	rs
Primary Nutrients in Fertilizer	3901	101	Tages 101 cen	The cent was	
Nitrogen	101/1				-
Phosphorus	1092				
Potash	1795				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Tons Purchased Through State		Tons Applied Per "E" Mile	
1970-71			
1971-72			
1972-73	1405		
Total Estin	nated Tons Applied on All Hig oted 2038	hways in 1972-73,	

Herbicio	les In	secticides	Fungicides	Total
Table 1 819.9		603.4	260.3	1683,6
Manure: Kind of	Tons	s of Materials	in Wet Manure I	Defecated
Livestock	Manur	e Nitrogen	Phosphorus	
Swine: Table 2	17352	87	24	66
Cattle: Table 3	225045	1260	225	1125
Sheep: Table 4	805	11	2	
Horses: Table 4	7668	53	8	146
Chickens: Table 5	Shoh	38	10	8
Turkeys: Table 5				
Total from Livestock, Tons	253274	11/19	269	1253
Fertilizers:	Tons of	Commercial Fer	tilizers Applie	d
		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	7501	1014	1092	1795

Salts: Applied on all highways, tons: Table 9 2038

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 907.2

				GREAT LAK	ES BASIN MA	TERIAL	USAGE IN	VENTORY			
	A	gricultur	al Chemic	als, Manu	res, Fertil	izers,	Lime and	Highway	De-Icing	Compou	nds
	P	LANNING A	REA:	Lake Mich	igan 2.0		STATE:_	Wiscons	sin		_
	P	LANNING S	UBAREA:	Southwest	2.2		COUNTY:_	Racine			_
OUNTS OF	CHEMI CAL	S USED ON	CROPS, 1	972		TABL	E 6-CROI	ACREAGE	S & FERT	LIZER	USED-
Herbi	cides	Insect	icides	Fungi	cides	COTIN	TY, land	area, ac	res (1)	215424	
Acres	Amount Used	Acres	Amount Used	Acres	Amount Used	Numb	er of far	rms		140480	

Acres Treated	100000000000000000000000000000000000000	Acres	Amount		Amount
	100 lbs	The state of the s	Used 100 lbs	Acres Treated	Used
30960	851.4	6880	103.2		
8551	42.7	2850			
5520	55.2	4600	46.0		
2076	20.7	2076	20.7		
13285	276.9	2010	151.3	1250	187.5
33/17	73.0	33/12	186.9	331/1	75.2
94	6.1	98	9.9	101	17.7
63827	1326.0	21855	546.5	14692	280.h
	8551 5520 2076 13285 33h1 9h	8551 42.7 5520 55.2 2076 20.7 13285 276.9 33h1 73.0 94 6.1	8551	8551         12.7         2850         28.5           5520         55.2         1600         16.0           2076         20.7         2076         20.7         2076           3385         276.9         2010         151.3           3311         73.0         3311         186.9           94         6.1         98         9.9	8551

TABLE 2-	-MANUKE FROM	DWINE		-
	Hog & Pig	Number Sov	ws Farrowing	
-	Inventory	Dec. 1-May 31	June 1-Nov. 30	Andrew Company
Year	Dec. 1	Spring	Fall	Total

Year	Dec. 1	Spring	Fall	Total
1964	15438	1210	1127	2337
1969	13293	1136	1105	55/1
1972	12000	950	950	1,900

Wet Manure Factor: Tons	per litter farrowed	7,23
Wet Manure Defecated: Ton	is, 1972	13737
Nutrients in Wet Manure:	Nitrogen, tons	69
	Phosphorus, tons	19
	Potash, tons	52

		Number Cattle	Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	26516	12906	13610			
1969 1972	2h273 2h300	10515 8000	13758 16300			
Wet Manure Per Anima	Factor: Tons	13,14	6,45			
Wet Manure Tons, 197		105120	105135			
		rogen, tons 11	10255 177 10			

Year Item	Sheep & Lambs	Horses & Ponies
1964	3521	
1969	2781	742
1972	2000	500
Wet Manure Factor: Tons per animal	1.61	12,78
Wet Manure Defecated: Tons, 1972	3220	6390
Nutrients in Wet Manure: Nitrogen,	Tons 15	1111
Phosphorus	, Tons 7	6
Potash, To	ns 32	38

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		118105		
1969		11.8024		
1972		152000		
Wet Manure Fact	or: Lbs. per bird	82.9		
	cated: Tons, 1972	6300		
Nutrients in We	t Manure: Nitrogen, tons	98	Combined	
	Phosphorus, tons	25		
	Potash, tons	22		-

-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	215/12/1	Number I-V farms	651
Number of farms	1020	Acres in I-V farms	121722
Acres in farms	140480	Cropland I-V farms	103687
Cropland in farms	11,7012	Harvested cropland	
Harvested cropland in farms	87253	I-V farms_	79726

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	28956	3957	1194	5151
GRAINS	15795	1371	40	1411
Wheat	3824	418	25	1443
Oats	9328	647	13	660
Barley	2571	303	2	305
Rye	144	2		
OTHER FIELD CROPS	14016	1198	10	1208
Soybeans	12659	hhi	6	1117
Potatoes	1147	757	14	761
Sugar beets				
Field beans				
HAY OR GRASS SILAGE	16380	509	3	512
PASTURED CROPLAND	8387	47	1	1,8
Cropland used for pasture	7404	39	1	40
Improved pasture	983	8	0	8
VEGETABLES, SWEET CORN, MELONS	3341	1081	33	ולנרנ
ORCHARDS	83 34	8	0	8
BERRIES	34	10	0	10
NURSERY & GREENHOUSE PRODUCTS	1650	919	0	919
OTHER CROPS	9	0	0	0
Total Fertilizer Used, Tons		9100	1281	10381
Percent of Fertilizer Used		88	12	100

TABLE 7FERTILIZER	ZER USED IN 1972 TABLE 8GROUND LIMESTONE EQUIVALENT						
Item Tons		Tonnage	Tonnage not				
Fertilizer Used on Crops: Solid	13059	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	3063	1972			3326		
Total	16122	Tonnages for Other Recent Years					
Primary Nutrients in Fertilizer	8383	101	mages for occ	M. Cerre 100			
Nitrogen	2180						
Phosphorus	2347						
Potash	3856						

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Through State	Tons Applied Per
1970-71		
1971-72	The second secon	
1972-73	4397 mated Tons Applied on All	

TABLE 10 -- SUMMARY OF ACRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide		cticides	Fungicides	Total
Table 1	1326.0	5	16.5	280.4	2152.9
Manure: Kind of		Tons	of Material	ls in Wet Manure	Defecated
Livestock		Manure	Nitroge	en Phosphorus	Potash
Swine: Tab	le 2	13737	69	19	52
Cattle: Ta	ble 3	210255	1177	210	1051
Sheep: Tab	le 4	3220	45	7	32
Horses: Ta	ble 4	6390	44	6	38
Chickens:	Table 5	6300	98	25	22
Turkeys: T	able 5		I.E.	-	
Total from Ton		239902	11:33	267	1195
Fertilizers	:	Tons of (		Fertilizers Appli	ed
				imary Nutrients	-
Ite		Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	16122	2180	2347	3856
Lime: Lime Tabl		alent purchas	sed or appl	ied, tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Total Tonnage

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin
PLANNING SUBAREA: Southwest 2.2 COUNTY: Walworth

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	89550	2462.6	19900	298.5		
Grains	8671	43.3	2890	28.9		
Hay or Grass Silage	12/180	124.8	1.0400	104.0		
Pastured Cropland	4431	44.3	4431	101.3		
Other Field Crops	9090	186.3	1040	62.9	500	75.0
Vegetables	10079	220.2	1.0079	563.7	10079	226.8
Orchards						
Berries	35	1.6	39	3.5	39	8.3
Nursery, Greenhouse						
Other Crops						
		4202	10000			
Totals	134336	3083.1		1105.8	10618	310.1
Total Herbicides, In	secticide	s, Fungic	ides: 10	0 lbs	193733	11199.

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	36309	31.62	2844	6006
1969	29364	2665	2241	4906
1972	28000	2000	2100	11200
Wet Manun	re Defecated:	re: Nitrogen, to Phosphorus, Potash, ton	2964 ons 148 tons 42	

TABLE 2 MANIEUR PROM CAPPELE

		Number Cattle	er Cattle and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	80081	40017	40064		
1969	58135	28780	29355		
1972	58500	25700	32800		
Wet Manure F Per Animal	factor: Tons	13,14	6.45		
Wet Manure D Tons, 1972		337698	211560		
	Defecated: Tons, 1972 n Wet Manure: Nitroge Phospho Potash,	en, tons 3076 orus, tons 5119			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	6489	
1969	31420	1124
1972	2700	800
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	4347	1022/1
Nutrients in Wet Manure: Nitrogen, Tons	61	71
Phosphorus, Tons	9	10
Potash, Tons	43	61

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		159445		
1969		114299		
1972		150000		
Wet Manure Fac	tor: Lbs. per bird	82.9	A COMPANY OF THE PARTY OF THE P	
wer ranture Det	ecated. Tone 1072	6218		
Nutrients in W	et Manure:		Combined	
	Nitrogen, tons	97		
	Phosphorus, tons	25		
	Potash, tons	55		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	3562211	Number I-V farms	1101
Number of farms	1354	Acres in I-V farms	246652
Acres in farms	26/12/16	Cropland I-V farms	202890
Cropland in farms	234524	Harvested cropland	
Harvested cropland in farms	168521	I-V farms	163825

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	85538	11335	4767	16102
GRAINS	21330	767	27	794
Wheat	983	767	1	148
Oats	17829	632	22	654
Barley	2419	88	3	91
Rye	69	0	0	0
OTHER FIELD CROPS	10708	1064	36	1100
Soybeans	8590	1420	21	141
Potatoes	571	303	0	303
Sugar beets				
Field beans	192	24	20	144
HAY OR GRASS SILAGE	36580	1047	30	1077
PASTURED CROPLAND	18060	335	3	338
Cropland used for pasture	15784	308	2	310
Improved pasture	2276	27	1	28
VEGETABLES, SWEET CORN, MELONS	10079	7498	292	1790
ORCHARDS	48	0	7	7
BERRIES	0	0	0	0
NURSERY & GREENHOUSE PRODUCTS	387	191	60	251
OTHER CROPS	80	5	0	5
Total Fertilizer Used, Tons		16266	5242	21508
Percent of Fertilizer Used		76	24	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

LADUS / PERTIFICION	JOHN LA LOTE	LADLI	APPLIED	THEOLORG DOOL
Item	Tons		Tonnage	Tonnage not
Fertilizer Used on Crops: Solid 27056	27056	Year	Government Cost/Shared	Government Cost/Share
Liquid	63146	1972		
Total	33402		mages for Oth	or Donnet Vo
Primary Nutrients in Fertilizer	17369	101	mages for oth	er necent re
Nitrogen	4516			
Phosphorus	4863			
Potash	7990			

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	145614	
	imated Tons Applied on All Hi puted 6620	ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	s Ins	ecticides	Fungicides	Total	
Table 1 3083.1		11	05.8	310.1	11199.0	
Manure: Kind	of	Tons	of Materials	in Wet Manure D	efecated	
Livestock		Manure	Nitrogen	Phosphorus	Potash	
Swine: Table	2	29643	148	42	113	
Cattle: Table 3		549258	3076	549	2746	
Sheep: Table 4		4347	61	9	43	
Horses: Table		10224	71	20	61	
Chickens: Tal	ble 5	6218	97	25	22	
Turkeys: Tabl			-	-	-	
Total from Li		599690	3453	635	2985	
Fertilizers:		Tons of		rtilizers Applie	d	
			Prim	ary Nutrients		
Item		Total	Nitrogen	Phosphorus	Potash	
Applied on Cro	opland:	33/102	h516	և863	7990	

Lime: Limestone equivalent purchased or applied, tons: Table 8 17512

Salts: Applied on all highways, tons: Table 9 6620

To Convert From
Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2,0 STATE: Wisconsin

PLANNING SUBAREA: Southwest 2.2

2.2 COUNTY: Washington
TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

	Herbi	cides	Insect	icides	Fungicides		
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	
Corn	38880	1069.2	8640	129.6			
Grains	14714	73.5	4905	49.0			
Hay or Grass Silage	13800	138.0	11500	115.0			
Pastured Cropland	4127	41.2	11.27	41.2			
Other Field Crops	500	11.8	220	23.2	200	30.0	
Vegetables	3581	78.2	3581	200.3	3581	80.6	
Orchards							
Berries	110	6.9	117	11.6	120	21.7	
Nursery, Greenhouse							
Other Crops							
Totals Total Herbicides, In	75712	1418.8	33090	569.9 00 lbs	3901	132.3	

	Hog & Pig		Number Sows Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	16180	2531	2390	4921
1969	11,399	2094	2150	Itshir
1972	12500	1900	2000	3900

Potash, tons\_

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves
1964	53977	29431	24546
1969	47184	26262	20922
1972	48500	23500	25000
Wet Manure Per Anima	Factor: Tons	13.14	6.45
Wet Manure Defecated: Tons, 1972		308790	161250
Wet Manure	Defecated: Tons, 19	72 Combined: 1700	lio.

Year Item	Sheep & Lambs	Horses & Ponies
1964	852	
1969	824	643
1972	800	500
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1288	6390
Nutrients in Wet Manure: Nitrogen, To	ons 18	144
Phosphorus,		6
Potash, Ton	s 13	38

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		151125		
1969		131370		
1972		167000		
	or: Lbs. per bird	82.9		
	cated: Tons, 1972	6922		
Nutrients in Wet Manure: Nitrogen, tons		108	Combined	
	Phosphorus, tons Potash, tons	28 2h	_	

Number of farms 11	14496 32 6302	Acre		farms 105k farms 1625	70
Cropland in farms 14	3768 2693		ested cro		
0	Cro	*	Tons o	of Fertilize	r Used Total
Crops		*/	100000		
GRAINS	338hh 25942		h198 1032	646 23	1055
Wheat	1360		78	1	79
	21.000		ol o	0.0	0/0

	Crop	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Tota	
CORN	338144	1198	646	1,81,1,	
GRAINS	25942	1,032	23	1055	
Wheat	1360	78	1	79	
Oats	24318	940	22	962	
Barley	123	10	0	10	
Rye	64	2	0	2	
OTHER FIELD CROPS	600	107	8	115	
Soybeans	467	142 64	8	142	
Potatoes	133	64	8	72	
Sugar beets					
Field beans	584	2	0	2	
HAY OR GRASS SILAGE	40240	715	7	722	
PASTURED CROPLAND	15197	60	0	60	
Cropland used for pasture	14140	60 58	0	60 58	
Improved pasture	1057	2	0	2	
VEGETABLES, SWEET CORN, MELONS	3581	645	54	699	
ORCHARDS	106	7	. 2	9	
BERRIES	34	23	0	23	
NURSERY & GREENHOUSE PRODUCTS	431	126	0	126	
OTHER CROPS	15	0	0	0	
Total Fertilizer Used, Tons		6915	740	7655	
Percent of Fertilizer Used		90	10	100	

TABLE 7FERTILIZER	USED IN 1972	Z TABLE 8GROUND LIMESTONE EQUIVALENT APPLIED				
Item	Tons		Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	9629	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	2259	1972			1332	
Total	11888		wasse for Oth	er Recent Yes		
Primary Nutrients in	1	100	nages for our	T RECEILC 160	Lo	
Fertilizer	6182	-				
Nitrogen	1607					
Phosphorus	1731					
Potash	281.11					

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	6740	

MARKET TO	mmarken o	44	A CONT OUT TITTO AT	MATTERTALE	ANTY	DETCROTTAN	DE TA	TATO	

Table 1 1h18.8					Fungicides 32.3	Tota 2121.0	
Manure: Ki				Is in Wet Manure Defecate			
Livestoc	DESCRIPTION OF THE PROPERTY OF	Manure			Phosphorus		
Swine: Tab		28197	1/11		39	107	
Cattle: Ta		470040	2632		170	2350	
Sheep: Table 4		1288				13	
Horses: Table 4		6390	18		6	38	
Chickens: Table 5		6922	108		28	24	
Turkeys: Table 5		-	-		-	12	
Total from Livestock, Tons		512837	2943		546	2532	
Fertilizers	:	Tons of C			lizers Appli	eđ	
					Nutrients		
Ite	70	Total	Nitrogen		Phosphorus	Potas	
Applied on Table 7	Cropland:	11888	1607		1731	2814	
Lime: Lime Tabl	stone equivale	ent purchas	ed or appli	ed,	tons:		

To Convert From
Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

PLANNING AREA: Lake Michigan 2.0 STATE: Wisconsin

PLANNING SUBAREA: Southwest 2.2 COUNTY: Waukeska

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	32850	903.3	7300	109.5		
Grains	7402	37.0	2467	24.6		
Hay or Grass Silage	10170	1.01.7	8475	84.7		
Pastured Cropland	3835	38.3	3835	38.3		
Other Field Crops	2715	57.4	500	41.7	350	52.5
Vegetables	1791	39.1	1791	100.2	1791	40.3
Orchards						
Berries	257	13.0	284	26.5	286	58.5
Nursery, Greenhouse						2000
Other Crops						
Totals		1189.8	24652	425.5	2427	151.3
Total Herbicides, In	secticide	s, Fungio	des: 10	00 1bs	86099	1766.6

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	10309	608	625	1233
1969	5645	486	508	994
1972	3500	800	800	1600

#### TABLE 3-MANURE FROM CATTLE

TRUCK 5 THE	NURE FROM CATTLE	Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964 1969 1972	15213 35935 37000	2 <u>1</u> 382 18318 1 <u>1</u> 800	20861 17617 22200		
Wet Manure Per Anima	Factor: Tons	13.14	6.45		
Wet Manure Tons, 197		194472	143190		
	Defecated: Tons, 1972 n Wet Manure: Nitroge Phospho Potash,	en, tons 18 orus, tons 3	37662 391 38 688		

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2826	
1969	1714	1494
1972	1700	4000
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2737	51120
Nutrients in Wet Manure: Nitrogen, Tons	38	353
Phosphorus, Tons	6	51
Potash, Tons	27	307

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys
1964		101.000		
1969		154385 75552		
1972		106000		
Wet Manure Fact	or: Lbs. per bird	82.9		
net namure bere	cated: Tone 1079	4394		
Nutrients in We	t Manure:		Combined	
	Nitrogen, tons	69		
	Phosphorus, tons	18		
	Potash, tons	15		

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acr	es (1) 351560	Number I-V farms 785
Number of farms	1224	Acres in I-V farms 139591
Acres in farms	167019	Cropland I-V farms 107513
Cropland in farms	125696	Harvested cropland
Harvested cropland in	farms 88409	I-V farms 80052

	Crop	Tons o	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	Total	
CORN	30591	1091	1317	51:08	
GRAINS	13582	491	12	503	
Wheat	900	39	0	39 1462	
Oats	12540	39 450	12	462	
Barley	83	3	0	3	
Rye	25	0	0	0	
OTHER FIELD CROPS	3968	460	2	1462	
Soybeans	3414	221	2	223	
Potatoes	553	238	0	238	
Sugar beets					
Field beans	219	2	0	2	
HAY OR GRASS SILAGE	29842	575	21	596	
PASTURED CROPLAND	15886	253	3	256	
Cropland used for pasture	13169	102	3	105	
Improved pasture	2717	151	0	151	
VEGETABLES, SWEET CORN, MELONS	1791	332	7	339	
ORCHARDS	326	62	6	68	
BERRIES	22	8	0	8	
NURSERY & GREENHOUSE PRODUCTS	602	308	0	308	
OTHER CROPS	217	2	0	2	
Total Fertilizer Used, Tons		6584	1368	7852	
Percent of Fertilizer Used		8h	16	100	

## TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons	-	Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	9877	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	2317	1972			3757
Total	12194		nages for Oth	er Recent Yes	
Primary Nutrients in Fertilizer	6341	101	nages tot och	I ISSUE TO	
Nitrogen	1649				
Phosphorus	1775				
Dotach	2022	To the second			

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	9661	
Total Estimat	ted Tons Applied on All Hi	ghways in 1972-73,

## TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	rbicides 189.8		ticides	Fungicides	Total 1766.6
Manure: Kind of		Tons o	f Materials	in Wet Manure D	
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2	110	568	58	16	lili
Cattle: Table 3	33	7662	1891	338	1.688
Sheep: Table 4	27	37	38	6	27
Horses: Table 4	51	120	353	51	307
Chickens: Table	5 43	94	69	18	15
Turkeys: Table !			-	-	-
Total from Livestock, Tons		71.81	21109	1429	2081

Fertilizers:	Tons of	Commercial Fer	tilizers Applie	đ		
		Primary Nutrients				
Item	Total	Nitrogen	Phosphorus	Potash		
Applied on Cropland:	12194	1649	1775	2917		

Lime: Limestone equivalent purchased or applied, tons:

Salts: Applied on all highways, tons: Table 9 11/012

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

1	Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
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PLANNING AREA:	Lake Michigan 2.0	STATE:	Dlinois
PLANNING SUBAREA:	Southwest 2.2	COUNTY:	Cook

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	13950	383.6	31.00	46.5		
Grains	2820	14.1	940	9.4		
Hay or Grass Silage	2010	20.1	1675	16.7		
Pastured Cropland	1396	13.9	1396	13.9		
Other Field Crops	20800	416.0	1300	13.0		
Vegetables	3655	87.9	1300 3655	295.1	3655	56.4
Orchards	1	0	1	.1	1	.2
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	lulu632	935.6	12067	394.7	3656	56.6

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	7098	3027	4071		
1969	6892	2715	1177		
1972	5300	2300	3000		
Wet Manure Per Anima	Factor: Tons	13.14	6.45		
Wet Manure Tons, 197		30222	19350		
	Defecated: Tons, 1972 n Wet Manure: Nitroge				
adelience I		rus, tons 50			
	Potash,	tons 248	3		

Year Ite		Sheep & Lambs	Horses & Ponies
1964		655	
1969		235	1350
1972		235	6980
Wet Manure Factor: Tons p	er animal	1.61	12.78
Wet Manure Defecated: Ton	s, 1972	378	89204
Nutrients in Wet Manure:	Nitrogen, Tons	5	616
	Phosphorus, Tons	1	89 535
	Potash, Tons	4	535

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	66590		
1969	66590 53548		
1972	126900	300	3000
Wet Manure Factor: Lbs. per	bird 82.9 1972 5260	355	89.63
Wet Manure Defecated: Tons,	1972 5260		27401
Nutrients in Wet Manure:		Combined	189
Nitrogen, t	ons 82		3
Phosphorus,	tons 21		1
Potash, ton	s 18		1

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	610688	Number I-V farms	470
Number of farms	713	Acres in I-V farms	81167
Acres in farms	92883	Cropland I-V farms	70li86
Cropland in farms	77613	Harvested cropland	
Harvested cropland in fa	rms 61203	I-V farms	56743

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	211,72	2901	1373	1,271
GRAINS	571-3 2146	259 124	115	371
Wheat		124	715 89	37 <u>1</u> 213
Oats	3454	124	26	150
Barley	140	11	. 0	11
Rye	3	0	0	0
OTHER FIELD CROPS	19135	404	1.00	504
Soybeans	19125	402	100	502
Potatoes	10	3	0	3
Sugar beets	0	0	0	0
Field beans	0	0	0	0
HAY OR GRASS SILAGE	4317	84	3	87
PASTURED CROPLAND	6460	8 <u>4</u> 51	0	51
Cropland used for pasture	4537	119	0	119
Improved pasture	1923	2	0	2
VEGETABLES, SWEET CORN, MELONS	4300	1334	79	11/13
ORCHARDS	1	0	0	0
BERRIES	0	0	0	0
NURSERY & GREENHOUSE PRODUCTS	2235	464	3	467
OTHER CROPS	3	0	0	0
Total Fertilizer Used, Tons		5497	1673	7170
Percent of Fertilizer Used		77	23	100

From Illinois Fertil	From Illinois Fertilizer Report Tons		APPLIED		
Item	Tons		Tonnage	Tonnage not	
Pertilizer Used on Crops: Solid	18487	Year	Government Cost/Shared	Government Cost/Shared	Tota
Liquid	1828	1972	150	3985	4135
Total	20315			er Recent Yes	
Primary Nutrients in Fertilizer	7184	101	mages for oth	Netent rea	
Nitrogen	4126				
Phosphorus	1582				
Potash	1476				

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
1972	150	3985	1135

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS Tons Applied Per Tons Purchased Through State 1970-71 1971-72 1972-73 1972-73 Total Estimated Tons Applied on All Highways in 1972-73, As Computed 1111195

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbicide	s In	secticides	Fungicides	Total
Table 1 935.6	39	1.7	56.6	1386.9
Manure: Kind of	Ton	s of Materials	in Wet Manure D	efecated
Livestock	Manur	e Nitrogen	Phosphorus	Potash
Swine: Table 2	7832	39	11	30
Cattle: Table 3	49572	278	50	21/8
Sheep: Table 4	378 89204	5	1	1
Horses: Table 4		616	89	535
Chickens: Table 5	5260	82	21	18
Turkeys: Table 5	189	3	1	1
Total from Livestock, Tons	152435	1023	173	836
Fertilizers:	Tons of	Commercial Fer	tilizers Applie	d
		Prima	ry Nutrients	Harris .
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	20315	4126	1582	1476

Table 8 4135

Salts: Applied on all highways, tons: Table 9 111/195

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

PLANNING AREA:	Lake Michigan	2.0	STATE:	Illinois	
PLANNING SHRARRA:	Southwest 2.2		COUNTY:	DiPage	

TARTE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	HSED	ON	CROPS.	1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	14850	408.3	3300	49.5		
Grains	2220	11.1	740	7.4		
Hay or Grass Silage	960	9.6	800	8,0		
Pastured Cropland	683	6.8	683	6.8		
Other Field Crops	15840	316.8	990	2.9		
Vegetables	475	11.4	475	38.4	475	7.3
Orchards	17	.8	20	2.1	20	5.2
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	35045	764.8	7008	122.1	1:95	12.5
Total Herbicides, In				0 lbs	42548	899.4

#### TABLE 2-MANURE FROM SWINE

Hog & Pig		Number Son Dec. 1-May 31		
Year	Dec. 1	Spring	Fall	Total
1964	10391	1152	872	2024
1969	5217	449	395 600	814
1972	11100	400	600	1000

Phosphorus, tons\_ Potash, tons\_

		Number Cattle and Calves			
Year Total	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	7805	2835	4970		
1969	2932	1110	1792		
1972	2500	900	1600		
Wet Manure F Per Animal	actor: Tons	13.24	6,45		
Wet Manure Defecated: Tons, 1972		11826	10320		
	efecated: Tons, 1972 Wet Manure: Nitroge Phospho Potash,	n, tons 12h rus, tons 22			

#### TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	636	
1969	132	1,39 2270
1972	200	2270
Wet Manure Factor: Tons per animal	1,61	12,78
Wet Manure Defecated: Tons, 1972	322	29011
Nutrients in Wet Manure: Nitrogen, Tons	3	200
Phosphorus, Tons	1	29
Potash, Tons	3	174

#### TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	615148		
1969	37893		
1972	18700	10	1.00
Wet Manure Factor: Lbs. per bird	82.9	365	89.63
Wet Manure Defecated: Tons, 1972	775		
Nutrients in Wet Manure: Nitrogen, tons	12	Combined	6
Phosphorus, tons	3		0
Potash, tons	3		0

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 200 Number I-V farms 296

Number of farms         L10           Acres in farms         7120L           Cropland in farms         63709           Harvested cropland in farms         51252	201 Cropland I-V farms 60105 709 Harvested cropland					
	Crop	-	of Fertilize			
Crops	Acres	Dry	Liquid	Total		
CORN	24898	2559	1299	3858		
GRAINS	4896	321	43	364		
Wheat	2838	270 51	143	323		
Oats	1962	51	0	51		
Barley	53	0	0	0.		
Rye	143	0	.0	0		
OTHER FIELD CROPS	18980	261	5	266		
Soybeans	18975	261	5	266		
Potatoes	5	0	0	0		
Sugar beets	0	0	0	0 0 51		
Field beans	0	0		0		
HAY OR GRASS SILAGE	2133	51	0	51		
PASTURED CROPLAND	2/165	10	0 0 0	10		
Cropland used for pasture	5700	7	0	7		
Improved pasture	62	3	0	3		
VEGETABLES, SWEET CORN, MELONS	559 26	113	0	113		
ORCHARDS	26	1	0	1		
BERRIES	0	0	0	0		
NURSERY & GREENHOUSE PRODUCTS	1083	258	0 5	263		
OTHER CROPS		0	0.	0		
Total Fertilizer Used, Tons		3574	1352	1,926		
Percent of Fertilizer Used		73	27	100		

TABLE 7-FERTILIZER L	SED IN 1972 Zer Report)	TABLE 8GROUND LIMESTONE EQUIVALENT APPLIED					
Item Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	7324	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	1395	1972		2926	2926		
Total	8719		nanna for Ork	er Recent Yea			
Primary Nutrients in Fertilizer	3725	101	mages for our	EI MEGELLE 150			
Nitrogen	1572				-		
Phosphorus	1139						
Potash	1014						

## TABLE 9-- SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73 Total Es	7303	

#### ACRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Berbicides	Inc	secticides	Fungicides	Total	
Table 1	764.8		22.1	12.5	899.1	
Manure: Kind	of	Tons	of Materials	in Wet Manure I		
Livestock		Manure	Nitrogen	Phosphorus		
Swine: Table 7	2	7120	36	10	27	
Cattle: Table 3		22146	124	22	111	
Sheep: Table		322	5	1	3	
Horses: Table	4	29011	200	29	175	
Chickens: Tabl	le 5	775	12	3	3	
Turkeys: Table	5	6	0	0	0	
Total from Livestock, Tons		59380	377	65	318	
Fertilizers:		Tons of	Commercial Fe	rtilizers Applie	d	
			Prin	ary Nutrients	-	
Item		Total	Witrogen	Phosphorus	Potasi	
Applied on Cros	oland: 8	719	1572	1139	1011	

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 10588

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: Illinois PLANNING AREA: Lake Michigan 2.0 COUNTY: Kane PLANNING SUBAREA: Southwest 2.2

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	93600 7860	2574.0	20800	312.0		
Grains	7860	39.3	2620	26.2		
Hay or Grass Silage	5310	53.1	11125	141.2		
Pastured Cropland	2948	29.4	2948	29.4		
Other Field Crops	1421480	849.6	2655	26.5		
Vegetables	949	22.8	949	76.6	949	14.7
Orchards						
Berries	48	h.h	45	5.5	49	6.4
Nursery, Greenhouse						
Other Crops						
Totals	153195	3572.6	ચીતીતે?	520.11	998	21.1

TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	57297	5712	1,190	9902
1969	46269	3976	3295	7271
1972	19900	4500	5800	10300

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	81601	1850L	63097		
1969	60010	13794	16216		
1972	66900	13100	53800		
Wet Manure Per Anima	actor: Tons	13.14	6,45		
Wet Manure I Tons, 1977		172134	347010		

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2749	
1969	2662	1328
1972	1600	6866
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2576	87747
Nutrients in Wet Manure: Nitrogen, Tons	36	605
Phosphorus, Tons	5	
Potash, Tons	26	88 526

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys
1964		98508		
1969		59638		
1972		39000	7.0	100
Wet Manure Facto	or: Lbs. per bird	82.9	365	89.63
Wet Manure Defea	ated: Tons, 1972	1617	224	2/100
Nutrients in Wet	Nitrogen, tons	25	Combined 6	
	Phosphorus, tons Potash, tons	6	0	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	332800	Number I-V farms	1036
Number of farms	1210	Acres in I-V farms	262643
Acres in farms	275228	Cropland I-V farms	230145
Cropland in farms	238038	Harvested cropland	100,000,000
Harvested cropland in farms	192963	I-V farms	188546

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	110936	14379	7139	21518
GRAINS	17733	583	72	655
Wheat	4508	295 281	60	355
Oats	12945		12	293
Barley	278	6 -	0	6
Rye	2	0	0	0
OTHER FIELD CROPS	43226	1190	102	1292
Soybeans	43104	1169	101	1270
Potatoes	37	21	1	22
Sugar beets				
Field beans		Vana.		
HAY OR GRASS SILAGE	15509	354	10	364
PASTURED CROPLAND	12432	197	11	208
Cropland used for pasture	10282	1.02	6	108
Improved pasture	2150	95	5	100
VEGETABLES, SWEET CORN, MELONS	1116	112	38	150
ORCHARDS	12	0	0	0
BERRIES	140	2	0	2
NURSERY & GREENHOUSE PRODUCTS	1009	275	103	378
OTHER CROPS	130	0	0	0
Total Fertilizer Used, Tons	200	17092	7475	24567
Percent of Fertilizer Used		70	30	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

(From Hilpois rerti	lizer Report	-	APPLIED		
FT 10 k Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	13868	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Total Liquid	1502h 28892	1972	2000	27120	29120
Primary Nutrients in Fertilizer		Ton	nages for Oth	er Recent Yea	ITS
Nitrogen	6877				-
Phosphorus	3199				
Potash	3813				

TABLE 9-- SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		THE RESERVE OF THE PERSON NAMED IN
1971-72		
1972-73	5340	
Total Estima	ted Tons Applied on All Hi	ghways in 1972-73.

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides 3572.6	-	o.h	Fungicides 21.1	Total
Manure: K	ind of	Tons	of Materials	in Wet Manure D	efecated
Livesto	ck	Manure	Nitrogen	Phosphorus	Potash
Swine: Tab	ole 2	73336	367	103	279
Cattle: Ta	able 3	5191111	2907	519	2596
Sheep: Tal	ole 4	2576	36	5	26
Horses: Table 4		87747	605	88	526
Chickens: Table 5		1617	25	6	6
Turkeys: Table 5		6	0	0	0
Total from Tor	Livestock,	684426	3940	721	3433
Fertilizers	3.1	Tons of (	Commercial Fer	rtilizers Applie	d
				ary Nutrients	1-1-
Ite		Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	28892	6877	3199	3813
	estone equival Le 8 29120		sed or applied	d, tons:	

To Convert From

To Pounds (1b) Acres (acre) Tons (ton) Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 .4047 907.2

Lake Michigan 2.0 STATE: Illinois PLANNING AREA:

PLANNING SUBAREA: Southwest 2.2 COUNTY: Lake

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	100 CO 10	Acres Treated	Amount Used 100 1bs
Corn	16470	452.9	3660	54.9		
Grains	5280	26.4	1760	17.6		
Hay or Grass Silage	2730	27.3	2275	22.7		
Pastured Cropland	2458	24.5	2458	24.5		
Other Field Crops	16320	326.4	1020	10.2		
Vegetables	1503	36.1	1503	121.4	1503	23.2
Orchards						
Berries	178	9.7	202	21.5	2011	49.4
Nursery, Greenhouse						
Other Crops						
Totals Total Herbicides, In	111939		12878	272.8	1707 5952h	72.6

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	10054	1072	788	1860
1969	7508	659	703	1362
1972	7200	700	1200	1900

Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	1480h	6305	8499
1969	11892	5099	6793
1972	13900	5100	8800
Wet Manure   Per Anima	Factor: Tons	13.14	6.45
Wet Manure I		67014	56760
			71.

TARLE A ... MANUER FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2207	
1969	2131	1713
1972	1200	8856
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1932	113180
Nutrients in Wet Manure: Nitrogen, Tons	27	781
Phosphorus, Tons	Li .	113
Potash Tons	19	679

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	1.06305		
1969	70287		-
1972	298700	50	500
Wet Manure Factor: Lbs. per bird	82.9 12381	365	89.63
Wet Manure Defecated: Tons, 1972	12381		1120112001
Nutrients in Wet Manure: Nitrogen, tons	193	Combined	31.
Phosphorus, tons Potash, tons	50 43		0

TABLE 6-- CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	292608	Number I-V farms 401 Acres in I-V farms 96584
Number of farms Acres in farms	110669	Cropland I-V farms 81116
Cropland in farms	90367	Harvested cropland
Harvested cropland in farm	s 64233	I-V farms 59771

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	20915	2804	834	3638
GRAINS	10694	678	49	727 388
Wheat	5227	347	111	388
Oats	4965	290	7	297
Barley	15	42	0	143
Rye	15	0		
OTHER FIELD CROPS	17990	71.2	19	731
Soybeans	17910	670	1.9	689
Potatoes	66	111	0	hI.
Sugar beets		11111		
Field beans				
HAY OR GRASS SILAGE	7421	178	1	179
PASTURED CROPLAND	9084	246	55	301
Cropland used for pasture	7879	186	55	247
Improved pasture	1205	60	0	60
VEGETABLES, SWEET CORN, MELONS	1768	lilio	20	460
ORCHARDS	235	26	1	27
BERRIES	21	1	0	1
NURSERY & GREENHOUSE PRODUCTS	1760	273	4	277
OTHER CROPS	30	0	.0	0
Total Fertilizer Used, Tons		5358	983	6341
Percent of Fertilizer Used				

TABLE 7-FERTILIZER USED IN 1972
(From Illinois Fertilizer Report)
FT 10 & Item Tons Fertilizer Used on Crops: Solid Liquid 1422h 2589 6813 Total Primary Nutrients in Fertilizer Nitrogen 2533 1093 757 683 Phosphorus

Potash

TABLE 8--GROUND LIMESTONE EQUIVALENT APPLIED Tonnage Tonnage not Government Total Government Tonnage Cost/Shared Cost/Shared Year 1.81/1 1824 1972 Tonnages for Other Recent Years

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS Tons Applied Per "E" Mile Tons Purchased Through State Year 1970-71 1971-72 1972-73 Total Estimated Tons Applied on All Highways in 1972-73, As Computed 21024

ARTE TO STOWARY OF ACRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	ecticides	Fungicides	Total
Table 1 903.3		2	72.8	72.6	1248.7
Manure: Ki	nd of	Tons	of Materials	in Wet Manure	
Livesto		Manure			
Swine: Table 2 Cattle: Table 3		13528	68	19	51
		123774	693	124	619
Sheep: Table 4		1932	27	1	19 679
Horses: Table 4		113180	781	113	
Chickens:	Table 5	12381	193	50	43
Turkeys: 1	Table 5	31	0	0	0
Total from Livestock, Tons		264826	1762	310	1411
Fertilizers	if .	Tons of	Commercial Fe	rtilizers Appli	ed
1010111111111			Prim	ary Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potasi
Applied on Table 7	Cropland:	6813	1093	757	683

Salts: Applied on all highways, tons: Table 9 21024

To Convert From Pounds (1b) Acres (acre) Tons (ton)

Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
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PLANNING AREA:	Lake Michigan 2.0	STATE:	Illinois	
DI ANNITAC CITRADUA .	Conthronal 2.2	COLINTY	Машант	

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	92070	2531.9	20160	306.9		
Grains	9540	47.7	3180	31.8		
Hay or Grass Silage	10560	105.6	8800	88.0		
Pastured Cropland	4834	48.3	4834	48.3		
Other Field Crops	27120	542.4	1695	16.9		
Vegetables	2973	71.6	2973	240.1	2973	45.9
Orchards						
Berries	57	3.9	61	6.7	63	12.7
Nursery, Greenhouse Other Crops						
Totals	1 m el	3351.11	Loons	738.7	3036	58.6

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	h1796	4537	3828	8365
1969	32879	3282	2877	6159
1972	31500	4100	4100	8200

		Number Cattle and Calv				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964 1969 1972	70242 58263 66100	31,121, 25692 26800	36118 32571 39300			
	Factor: Tons	13.14	6.45			
Wet Manure 1 Tons, 1972	A CONTRACTOR OF THE PARTY OF TH	352152	253485			
	Defecated: Tons, 1972 i Wet Manure: Nitroge Phospho Potash,	n, tons 339				

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep &	Horses & Ponies	
1964	31,86		
1969	2161	1/130	
1972	1500	7393	
Wet Manure Factor: Tons per animal	1.61	12.78	į
Wet Manure Defecated: Tons, 1972	2415	91,1183	Ī
Nutrients in Wet Manure: Nitrogen, Tons	34	652	ñ
Phosphorus, Tons	5	94	1
Potash, Tons	24	567	g

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys
1964		86091		
1969		31103811		
1972		208200	500	5000
Wet Manure Fac	tor: Lbs. per bird	82.9	365	89.63
Wet Manure Defe	ecated: Tons, 1972	8630		07.00
Nutrients in Wet Manure: Nitrogen, tons		135	Combined	314
	Phosphorus, tons Potash, tons	35 30	-	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	390528	Number I-V farms	1212
Number of farms	1507	Acres in I-V farms	274570
Acres in farms	289656	Cropland I-V farms	232777
Cropland in farms	243321	Harvested cropland	
Harvested cropland in farms	184108	I-V farms	179476

	Crop	Tons	Tons of Fertilizer		
Crops	Acres	Dry	Liquid	Tota	
CORN	99172	13292	5318	18610	
GRAINS	19469	896	36 12	932	
Wheat	2628	210	12	222	
Oats	15901	633	214	657	
Barley	914	633 52	0	52	
Rye		1	0	1	
OTHER FIELD CROPS	28991	1325	204	1529	
Soybeans	28983	1322	50/1	1526	
Potatoes	7	2	0	2	
Sugar beets					
Field beans					
HAY OR GRASS SILAGE	28574	754	13	767	
PASTURED CROPLAND	20253	335	9	344	
Cropland used for pasture	17385	119	9	128	
Improved pasture	2868	216	0	216	
VEGETABLES, SWEET CORN, MELONS	3498	699	118	817	
ORCHARDS	52	2	0	2	
BERRIES	22	0	0	0	
NURSERY & GREENHOUSE PRODUCTS	829	1438	0	1438	
OTHER CROPS	1,1	0	0	0	
Total Fertilizer Used, Tons		17711	5698	23439	
Percent of Fertilizer Used		76	2/4	100	

TABLE 8--GROUND LIMESTONE EQUIVALENT TABLE 7-FERTILIZER USED IN 1972 (From Illinois Fertilizer Report) FILO & Item Tons APPLIED Tonnage Tonnage not Fertilizer Used on Crops: Solid Liquid Government Cost/Shared Government Total Cost/Shared Tonnage Total 18003 Year 927L 27277 1972 20660 21160 Total Primary Nutrients in Tonnages for Other Recent Years Fertilizer Nitrogen Phosphorus 13690 1,655 3771

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

5261

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	14260	
Total Estim As Compu	sated Tons Applied on All Hig sted 6179	thways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides		ecticides	Fungicides	Total
Table 1 3351.4			738.7	58.6	11118.7
Manure: Kir	nd of	Tons	of Materials	in Wet Manure D	efecated
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Tabl	e 2	58384	292	82	222
Cattle: Tab	le 3	605637	3392	606	3028
Sheep: Tabl	Le 4	2415	34	3	24
Horses: Tal	le 4	914183	652	94	567
Chickens: '	Table 5	8630	135	35	30
Turkeys: Ta	able 5	331	5	1	7
Total from I	ivestock,	769863	4510	823	3872
Fertilizers		Tons of	Commercial Fe	rtilizers Applie	d
			Prim	ary Nutrients	
Iter	n	Total	Nitrogen	Phosphorus	Potash
Applied on (	Cropland:	27277	4655	3771	5264

Lime: Limestone equivalent purchased or applied, tons: Table 8 21160 Salts: Applied on all highways, tons: Table 9 6179

Multiply By

0.453

907.2

Potash

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA:	Lake Michigan 2.0	STATE:	Illinois
DI ANNITHIC CHRADRA.	Southwest 2.2	COUNTRY.	W517

TARTE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	HISED	CHAI	CROPS	1972

Cron Crown	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	114030	3135.8	25340	380.1		
Grains	10140	50.7	3380	33.8		
Hay or Grass Silage	lililio	1111-11	3700	37.0		
Pastured Cropland	3700	37.0	3700	37.0		
Other Field Crops	93520	1870.4	5845	58.4		
Vegetables	1480	35.6	11/80	119.5	11:80	22.9
Orchards						
Berries	11	1.0	10	1.2	11	1.2
Nursery, Greenhouse						
Other Crops						
	E IIII-X					
Totals	227321	5174.9	1,31,55	667.0	11:91	24.7

TABLE 2--MANURE FROM SWINE

	Hog & Pig		vs Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	33272	3234	2966	6200
1969	31228	2664	2889	5553 6200
1972	27900	2900	3300	6200

		Number Cattle and Calv				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	34998	12684	22314			
1969	27119	10121	17028			
1972	31000	10400	20600			
Wet Manure : Per Anima	Factor: Tons	13,14	6,45			
Wet Manure 1		136656	132870			
		en, tons 1 orus, tons 2	69526 509 70 318			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	5139	
1969	2597	1722 8903
1972	31.00	8903
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	4991	113780
Nutrients in Wet Manure: Nitrogen, Tons	70	785
Phosphorus, Tor	70 ns 10	11/4
Potash, Tons	50	683

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		147715		
1969		514273		
1972		538100	500	5000
Wet Manure Factor	r: Lbs. per bird	82.9	365	89.63
Wet Manure Defect	ated: Tons, 1972	22304		
Nutrients in Wet	Manure: Nitrogen, tons	348	Combined	314
	Phosphorus, tons	89		No.
	Potash, tons	78	1	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969 COUNTY, land area, acres (1) 51,2336 Number I-V farms 1519

Number of farms         1845           Acres in farms         39340           Cropland in farms         2940           Harvested cropland in farms         34745	8 Harvested cropland				
Crops	Crop Acres	Tons	of Fertilize	Tota	
CORN	111636	13752	112h7	21,999	
GRAINS	26752	1403	E3E		
Wheat	26157 7401	646	535 228	1938 874	
Oats	18409	734	304	1038	
Barley	217	16	2	18	
Rye	130	8	0	8	
OTHER FIELD CROPS	103119	1,072	323	1395	
Soybeans	102110	961	323 253	1214	
Potatoes	0	0	0	0	
Sugar beets					
Field beans					
HAY OR GRASS SILAGE	11,951	189	22	505	
PASTURED CROPLAND	19865			203	
Cropland used for pasture	13473	164	6	172	
Improved pasture	6392	25	6	31 464	
VEGETABLES, SWEET CORN, MELONS	1741	426	38		
ORCHARDS	1	0		0	
BERRIES	10	2	0	2	
NURSERY & GREENHOUSE PRODUCTS	308	113	40	153	
OTHER CROPS	32	9	0	9	
Total Fertilizer Used, Tons		171419	12219	29668	
Percent of Fertilizer Used		59	11	100	

From Illinois Fertil	Zer Report		APPLIED		
Fertilizer Used on Crops: Solid	11379	Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
Liquid Total	19375 30754	1972	100	56650 er Recent Yea	56750
Primary Nutrients in Fertilizer	13025	100	itages for oth	ICI NGCERE AGO	
Nitrogen	6100	_			
Phosphorus	3656				
Potash	3269				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	12500	
Total Estima As Comput	ted Tons Applied on All Hi	ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1 5174.9		7.0	Fungicides 24.1	Total 5866.0
Manure: Kind of			in Wet Manure De	
Livestock	Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2	44744	221	62	168
Cattle: Table 3	269526	1509	270	1318
Sheep: Table 4	4991	70 785	10	50 683
Horses: Table 4	113780	785	111	683
Chickens: Table 5	22304	31,8	89	78
Turkeys: Table 5	371	5	1	1
Total from Livestock, Tons	455059	2938	5146	2328
Fertilizers:	Tons of (	Commercial Fer	tilizers Applied	1
		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	30754	6100	3656	3269
Lime: Limestone equiv. Table 8 56750		ed or applied	, tons:	-

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

		1	GREAT LAK	ES BASIN MAT	TERIAL USAGE INVENTORY	
A	gricultur	al Chemic	als, Manu	res, Fertil	izers, Lime and Highway De-Icing Compounds	
P	LANNING A	REA:	Lake Mich	nigan 2.0	STATE: Indiana	
P	LANNING S	UBAREA:	Southwest	t 2.2	COUNTY: Lake	
II CAI	S USED ON	CROPS, 1	972		TABLE 6CROP ACREAGES & FERTILIZER USEDCLASS I-V CENSUS FAR	MS, 1969
3	Insect	icides	Fungi	cides	COUNTY, land area, acres (1) 328000 Number I-V farms	618
mt ed	Acres	Amount Used	Acres	Amount Used	Number of farms 878 Acres in I-V farms Acres in farms 167771 Cropland I-V farms	155322 13668h
1bs	Treated	100 lbs	Treated	100 lbs	Cropland in farms 1111994 Harvested cropland	106975

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	56641	1557.6	12587	188.8		
Grains	6220	31.0	2073	20.7		
Hay or Grass Silage		24.9	2075	20.7		
Pastured Cropland	2416	24.1	2416	24.1		
Other Field Crops	32320	646.4	2020	20.2		
Vegetables	1816	69.5	1816	28.0	1816	132.2
Orchards						
Berries	29	2.7	27	3.3	30	3.8
Nursery, Greenhouse		1910				
Other Crops						
Totals	101932	2356.2	2301h	305.8	1846	136.0

	Hog & Pig	Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	13978	2528	1132	2550
1969	13529	1251	11.95	21/16 2518
1972	(1) 13927	1223	1295	2518

(1) Farrowing trends applied to get 1972 Inventory number -- not available in

		Cows & Heifers	W. J. P Paranta
Year	Total	Calved	Heifers, Steers Bulls, Calves
1964	17669	6936	10733
1969	14228	5477	8751
1972	(1) 15172	(1) 5840	(1) 9332
Wet Manure F Per Animal	actor: Tons	13.14	6.45
Wet Manure I		76738	60191

Year Item	Sheep & Lambs	Horses & Ponies
1964	1246	
1969	1390	720
1972	(1) 1209	2743
Wet Manure Factor: Tons per animal	1.61	12,78
Wet Manure Defecated: Tons, 1972	1946	35056
Nutrients in Wet Manure: Nitrogen, Tons	27	21/2
Phosphorus, Tons	1	35
Potash, Tons	19	210

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	143695		
1969	68181		
1972	(1) 56788	600	6000
Wet Manure Factor: Lbs. per bird	82.9	365.0	89.63
Wet Manure Defecated: Tons, 1972	2354		
Nutrients in Wet Manure:		Combined	377
Nitrogen, tons	37		6
Phosphorus, tons	9	1	2
Potash, tons	8		1

(1) State trends applied to obtain 1972 county figures.

COUNTY, land area, acres       (1)         Number of farms       878         Acres in farms       16777         Cropland in farms       11499         Harvested cropland in farms       11150	Acre Crop	Acres in I-V farms 155322 Cropland I-V farms 136684 Harvested cropland I-V farms 106975			
Crops	Crop Acres	Tons o	f Fertilize Liquid	r Used Tota	
CORN	53015	6889	4546	11435	
GRAINS	12506	1211	361	1572	
Wheat	7456	836	310 51 0	1,11,6	
Osts	4713	367	51	117.8	
Barley	122	1		1	
Rye	215	8	0	8	
OTHER FIELD CROPS	32771	11.78	226	Holi	
Soybeans	32433	1102	215	1317	
Potatoes	53	1.9	3	22	
Sugar beets					
Field beans	43	14	0	14	
HAY OR GRASS SILAGE	6883	250	23	273	
PASTURED CROPLAND	9666	252	15	267	
Cropland used for pasture	7934	223	15	238	
Improved pasture	1732 2215	739	0	844	
VEGETABLES, SWEET CORN, MELONS	2215	739	105		
ORCHARDS	6	0	0	0	
BERRIES	25	4	0	14	
NURSERY & GREENHOUSE PRODUCTS	425	171	29	200	
OTHER CROPS	75	0	0	0	
Total Fertilizer Used, Tons		10698	5305	1,6003	
Percent of Fertilizer Used		67	33	100	

TABLE 7FERTILIZER U	ISED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	10803	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	8805	1972	162	13860	11/022
Total	19608			er Recent Yea	irs
Primary Nutrients in Fertilizer	8805	100			
Nitrogen	2815				
Phosphorus	2529				
Potash	3461				

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	19647 ted Tons Applied on All Hi	

	TABLE	10SUMMARY	OF	AGRICULTURAL	MATERIALS	AND	HIGHWAY	DE-ICING
F								

305. Tons Manure 19227 136929 1946 35056 2354 377	of Materials i	n Wet Manure De Phosphorus 27 137 4 35	2798.0 fecated Potash 73 680 19 210 8
Manure 19227 136929 1946 35056 2354	96 767 27 242	27 137 4 35	73 681 19 210
19227 136929 1946 35056 2354	96 767 27 242	27 137 4 35	73 68h 19 210
136929 1946 35056 2354	767 27 242	137 4 35	68) 19 210
1946 35056 2354	27 242	35	19 210
1946 35056 2354	242		210
2354			
	37	9	D
377	6		0
		2	1
195889	1175	214	995
Tons of (			
			1 -
Total	Nitrogen	Phosphorus	Potash
19608	2815	2529	3461
alent purchas	sed or applied	, tons:	
	Tons of Total 19608 alent purchash022	Tons of Commercial Fert	Tons of Commercial Fertilizers Applied Primary Nutrients Total Nitrogen Phosphorus 19608 2815 2529 alent purchased or applied, tons:

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA:	Lake Michigan 2.0	STATE:	Indiana
PLANNING SUBARRA:	Southwest 2.2	COUNTY:	La Porte

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS,	1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	95360	2622.4	21191	31.7.8		
Grains	11207	56.0	3736	37.3		
Hay or Grass Silage	4020	40.2	3350	33.5		
Pastured Cropland	3026	30.2	3026	30.2		
Other Field Crops	49040	980.8	3065	30.6		
Vegetables	71:33	511.9	1433	22.1	1433	101.4
Orchards						
Berries	1073	56.1	1081	120.1	1098	280.8
Nursery, Greenhouse						
Other Crops						
Totals	165159	3840.6	36882	591.6	2531	385.2

TABLE 2MANURE FRO	M SWINE
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	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	20157	2854	2592	5446
1969	26947	2484	2075	4559
1972 (	1) 25869	1848	2524	4372

13/2 (1) 63003	1000	2/1-14	1 1921	
Wet Manure Factor:	Tons per litter	farrowed	7,636	
Wet Manure Defecat		No.	33385	
Nutrients in Wet Manure: Nit	anure: Nitrogen,	tons	1.67	
	Phosphoru	s, tons	147	
	Potash, t	ons	127	

(1) Farrowing trends applied to obtain Hog & Pig Inventory for 1972.
TABLE 3-MANUSE FROM CATTLE

		Number Catt	Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964 1969 1972	27419 22734 (1) 24242	100hl 8657 (1) 9231	17375 1h077 (1) 15011			
	Factor: Tons	13.14	6.45			
Wet Manure Tons, 19	Defecated:	121295	96821			
	Defecated: Ton in Wet Manure:	Nitrogen, tons 2	218116 2221 218 2091			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	3255	
1969	2613	577
1972	(1) 2273	2198
Wet Manure Factor: Tons per animal	1,61	12.78
Wet Manure Defecated: Tons, 1972	3660	28090
Nutrients in Wet Manure: Nitrogen, Tons	51	194
Phosphorus, Tons	8	28
Potash, Tons	37	169

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	114325		
1969	343408		
1972	(1) 286025		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	82.9 11856		
Nutrients in Wet Manure:	185 17 11	Combined	

(1) State trends applied to county as county figures for 1972 not available.

Kilograms (kg) Hectare (ha) Kilograms (kg)

0.453 .4047 907.2

(1) County, land area, acres includes water areas under 40 acres in size.

COUNTY, land area, acres	acres (1) 388608		Number I-V farms 951			
Number of farms	1371	Acre	s in I-V f	arms	26958	3
Acres in farms	293428	Crop	land I-V f	arms	23200	5
Cropland in farms	248446	Harv	ested crop			
Harvested cropland in fa	rms 182446		I-V f	farms_	17514	
		Crop	Tons of	Fert	ilizer	Used
Crops		Acres	Dry	Liq	uid	Tota

	Crop	Tons	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Tota		
CORN	831/10	11905	6869	18774		
GRAINS	221115	2580	351	2931		
Wheat	1.7834	2133	337	21,70		
Oats	4085	1,15	111	429		
Barley	206	11	0	11		
Rye	311	21	0	21		
OTHER FIELD CROPS	57225	2457	451	2908		
Soybeans	55902	2113	315	21428		
Potatoes	512	213	33	246		
Sugar beets						
Field beans	765	0	0	0		
HAY OR GRASS SILAGE	10520	393	34	427		
PASTURED CROPLAND	12101	279	10	289		
Cropland used for pasture	10580	211	10	221		
Improved pasture	1524	68	0	68		
VEGETABLES, SWEET CORN, MELONS	1748	1554	0	1554		
ORCHARDS	1177	117	0	117		
BERRIES	168	17	0	17		
NURSERY & GREENHOUSE PRODUCTS	270	127	0	127		
OTHER CROPS	246	11	7	18		
Total Fertilizer Used, Tons		19440	7722	27162		
Percent of Fertilizer Used		72	28	100		

rable 7 FERTILIZER From Indiana Fertili Reports-Spring & Fall	1 1973) Tons
Fertilizer Used on Crops: Solid	25853
Liquid	18749
Total	14602
Primary Nutrients in Fertilizer	22749
Nitrogen	8145
Phosphorus	5831
Potash	8483

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
1972	1652	36456	38108
Ton	nages for Oth	er Recent Yea	rs

TABLE 9-- SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	7789	
Total Estima As Comput	ted Tons Applied on All E	lighways in 1972-73,

	Herbicid	es Ins	ecticides	Fungicides	Total
Table 1	3840.6	591	.6	385.2	h817.h
Manure: Kind of		Tons	of Materials	in Wet Manure D	
Livestoc	k	Manure	Nitrogen	Phosphorus	Potash
Swine: Tab		33385	167	1/7	127
Cattle: Ta		218116	1221	218	1091
Sheep: Tab		3660	51	8	37
lorses: Table 4		28090	194	28	169
Chickens:		11856	185	47	1.7
Turkeys: T		0	0	0	0
Total from Ton	Livestock,	295107	1818	348	1465
Fertilizers	4	Tons of		rtilizers Applie	đ
				mary Nutrients	1 20000
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	1/1/602	8445	5831	8483

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
CONTRACTOR OF THE PARTY OF THE								

PLANNING AREA:	Lake Michigan 2.0	STATE:	Indiana
PLANNING SUBAREA:	Southwest 2.2	COUNTY:	Porter

TABLE 1 POTT	MATTETY AM	OUNTER OF	CHEMICATS	HIGHT ON	CROPS	1972

icides	Fungi	icides
Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
179.5		
24.0		
19.2		5
19.0		
20.7		
1.6	104	7.6
10.0	91	22.2
071. 0	100	29.8
	74.0	

	Hog & Pig	Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	21106	2326	1988	1,311
1969	18343	1803	1740	3543
1972	(1) 22987	2297	21/13	lililio

Wet Manure Factor: Tons	nor litter forward	2 (2)
Wet Manure Defecated: Tons		7.636 33904
Nutrients in Wet Manure:	Nitrogen, tons	170
	Phosphorus, tons	47
	Potash, tons	129

(1) Farrowing trends applied to obtain 1972 Inventory.
TABLE 3-MANURE FROM CATTLE

CONTRACTOR SECTION		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	18631	6678	11.953			
1969 1972	11.715	1590 (1) 1895	7125			
Wet Manure Per Anim	Factor: Tons	13.14	6.45			
Wet Manure Defecated: Tons, 1972		61320	49001			
Wet Manure	Defecated: Tons, 1972 in Wet Manure: Nitros		L3321 35			
	Phosph	norus, tons 1	1.3 57			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2970	
1969	2836	605
1972	(1) 2468	2305
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	3973	29458
Nutrients in Wet Manure: Nitrogen, Tons	56	203
Phosphorus, Tons	8	29
Potash, Tons	40	177

TABLE 5-MANUER FROM CHICKENS & TUDEVEYS

Year Item	Chickens	Turkey	Turkeys Raised
1964	112785		
1969	109337		
1972	(1) 91067	120	1200
Wet Manure Factor: Lbs. per bird	82.9	365.0	89.63
Wet Manure Defecated: Tons, 1972	3775		1
Nutrients in Wet Manure: Nitrogen, tons	59	Combined	75 1
Phosphorus, tons Potash, tons	15		0

(1) State trends applied to obtain 1972 county figures.

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 271680	Number I-V farms	600
Number of farms	946	Acres in I-V farms	153033
Acres in farms	174868	Cropland I-V farms	
Cropland in farms	150676	Harvested cropland	
Harvested cropland in f.	arms 116432	I-V farms	108780

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	52988	7038	5013	12051
GRAINS	15846	1794	248	50/15
Wheat	11794	1433	206	1639
Oats	3879	350	39	389
Barley	20	0	0	0
Rye	153	11	2	13
OTHER FIELD CROPS	34451	1302	240	1542
Soybeans	34374	1291	235	1526
Potatoes	111	5	0	5
Sugar beets				
Field beans	3111	0	0	0
HAY OR GRASS SILAGE	5511	7119	35	184
PASTURED CROPLAND	7624	207	53	260
Cropland used for pasture	6191	166	49	215
Improved pasture	1433	41	4	
VEGETABLES, SWEET CORN, MELONS	127	61	7	68
ORCHARDS	90	18	0	18
BERRIES	20	6	2	8
NURSERY & GREENHOUSE PRODUCTS	0	0	0	0
OTHER CROPS	39	0	0	0
Total Fertilizer Used, Tons		10575	5598	16173
Percent of Fertilizer Used	COT SECTION	65	35	100

(1) TABLE 7-FERTILIZER USED IN 1973 TABLE 8-GROUND LIMESTONE EQUIVALENT (Spring & Fall 1973 Indiana Fertilizer Applied

Townson Romowton			2.55 E 25 N. 255			
Tonnage Reports)	Tons		Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	17448	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	13225	1972		17919	17919	
Total	30673			ner Recent Years		
Primary Nutrients in Fertilizer	14651	101	mages for our	THE MECCHIC TEN		
Nitrogen	5165				-	
Phosphorus	4065					
Potash	51:27					

(1) Full year information available for only 1973.

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	7304	
Total Esti As Comp	mated Tons Applied on All Hi uted 1059h	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Inse	cticides	Fungicides	Total
Table 1	2230.5	274.0		29.8	2534.3
Manure: Ki	nd of	Tons (	of Materials	in Wet Manure 1	
Livesto	k	Manure	Nitrogen	Phosphorus	Potash
Swine: Tab	le 2	33904	170	1.7	129
Cattle: Ta	ble 3	113321	635	113	567
Sheep: Tab		3973	56	- 8	110
Horses: Ta	ble 4	3973 56 29458 203		29	177
Chickens:	Table 5	3775	59	15	13
Turkeys: 7	able 5	75	1	0	0
Total from Tor		184506	11.24	212	926
Fertilizers	11	Tons of C	ommercial Fe	rtilizers Applie	bs
			Prin	mary Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potasi
Applied on Table 7	Cropland:	30673	30673 5165		5421
	estone equival		ed or applie	ed, tons:	

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

Lake Michigan 2.0 STATE: Indiana PLANNING AREA: PLANNING SUBAREA: Southwest 2.2 COUNTY: Starke

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	54040	1486.1	12009	180.1		
Grains	1601	8.0	534	5.3		
Hay or Grass Silage	1050	10.5	875	8.7		
Pastured Cropland	31409	14.0	1409	14.0		
Other Field Crops	25140	508.8	1590	15.9		
Vegetables	66	2.5	66	1.0	66	4.8
Orchards						
Berries	86	8.5	78	9.7	86	9,1
Nursery, Greenhouse						
Other Crops						
Totals	83692	2038.1	16561	234.7	152	13.9
Total Herbicides, In					100005	2287.0

WADED	2MANURE	PROM	CUITNE

Hog & Pig		Number So	Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	16228	1668	11,00	3068	
1969	13412	1517	1267	2784	
1972	(1) 15912	1726	1577	3303	

Wet Manure Factor: Tons per litter farrowed 7,636
Wet Manure Defecated: Tons, 1972 25222
Nutrients in Wet Manure: Nitrogen, tons 126
Phosphorus, tons 35 Potash, tons\_

(1) Farrowing trends applied to obtain 1972 Inventory.

	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	6299	2529	3770			
1969	6162	2227	3935			
1972	(1) 6571	(1) 2375	(1) 4196			
Wet Manure Per Anis	Factor: Tons	13.14	6.45			
Wet Manure Tons, 19	Defecated:	31208	27064			

TARLE &	MANURE	FROM	SHEEP	AND	HORSES	

Year Item	Sheep & Lambs	Horses & Ponies
1964	947	
1969	91.7	301
1972	a) 824	1347
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1327	11,659
Nutrients in Wet Manure: Nitrogen, Tons	19	101
Phosphorus, Tons	3	15
36 4 61	7.7	88

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	113555		
1969			
1972	(1) 147621		
Wet Manure Factor: Lbs. per bird	82.9		
wet Manure Defecated: Tons, 1972	6119		
Nutrients in Wet Manure: Nitrogen, tons	95	Combined	
Phosphorus, tons	24		
Potash, tons	21		-

(1) State trends applied to obtain 1972 county figure.

Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Salts: Applied on all highways, tons: Table 9 5794

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	198656	Number I-V farms	1,67
Number of farms	754	Acres in I-V farms	71/J1308
Acres in farms	159478	Cropland I-V farms	116182
Cropland in farms	124972	Harvested cropland	
Harvested cropland in farms	92370	I-V farms	87119

	Crop	Tons o	of Fertilize	r Used	
Crops	Acres	Dry	Liquid	Total	
CORN	44441	7235	4003	11238	
GRAINS	4505	534 438	65	599	
Wheat	3394	438	64	502	
Oats	359	39	0	39	
Barley	14		0	0	
Rye	71.8	56	1	57	
OTHER FIELD CROPS	35987	3011	633	3677	
Soybeans	31.897	1830	557	2387	
Potatoes	1665	625	Ö	625	
Sugar beets					
Field beans				-	
HAY OR GRASS SILAGE	2607	155	0	155	
PASTURED CROPLAND	5635	197	51	248	
Cropland used for pasture	14135	112	51	163	
Improved pasture	1500	85	0		
VEGETABLES, SWEET CORN, MELONS	80	31	6	37	
ORCHARDS	3	0	0		
BERRIES	811	12	0	12	
NURSERY & GREENHOUSE PRODUCTS	17	0	0	0	
OTHER CROPS	237	1.0		10	
Total Fertilizer Used, Tons		11218	4.758	15976	
Percent of Fertilizer Used		70	30	100	

(1) TABLE 7-FERTILIZER USED IN 1973 TABLE 8-GROUND LIMESTONE EQUIVALENT

(Spring & Fall 19/3 Tonnage Reports)	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	17408	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	19355	1972	222	13937	11159		
Total	36763	Ton		er Recent Yea			
Primary Nutrients in Fertilizer	18661	100	mageo roz ere				
Nitrogen	7315			-			
Phosphorus	4931						
Potash	6415						

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	3995	
Total Estim As Compu	ated Tons Applied on All Hi ted 5794	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicid	es Ir	nsecticides	Fungicides	Total
Table 1	2038.4		34.7	13.9	2287.0
Manure: K	ind of	Tor	as of Materia	ls in Wet Manure	
Livesto		Manu	re Nitroge	en Phosphorus	
Swine: Ta		25222	126	35 58	96
Cattle: T		58272	326	58	291
Sheep: Ta		1327	19	3	13
Horses: T		11,659	101	15	88
Chickens:	Table 5	6119	95	214	21
Turkeys:		0	0	Ų.	.0.
	Livestock,	105599	667	135	509
Fertilizer	's:	Tons o		Fertilizers Appli	ed
TO A BUILDING			Pr	imary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potasi
	Cropland:	36763	7315	4931	61:15

TO A CALL AND SOFT		Prima		
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	36763	7315	4931	61.15
Lime: Limestone equi	valent purch	sed or applied	i, tons:	

# 5.4 Planning Subarea 2.3

Planning Subarea 2.3 contains 6 Indiana and 19 Michigan counties. The total land area is 3,645,130 hectares (9,000,320 acres). Land in farms totals 2,303,370 hectares (5,884,857 acres) or 65 percent of the total.

# 5.4.1 Agricultural Characteristics

Agricultural activities are very important in PSA 2.3. This subarea, together with PSA 2.4, produces about one half the Great Lakes Basin's fruit output. Corn, hay or grass silage, wheat and soybeans are important crops.

Table 5-50 indicates the relative proportions of materials usage in the planning subarea as compared to the total Great Lakes Basin.

Table 5-50

MATERIALS USAGE BASIN RELATIONSHIP -- PSA 2.3 TO GREAT LAKES

Per harvested acre of cropland	Planning Subarea 2.3	Great Lakes Basin
Lbs of chemicals applies Index of chemicals used	3.27 113	2.66 100
Tons of livestock manure defecated Index of manure defecated	3.77 112	3.37 100
Lbs primary nutrients in livestock ma Index of primary nutrients in manure	nure 94 115	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	345 24 107	321 22 100
Lbs primary nutrients in commercial : Index primary nutrients in commercial	fertilizer 161 fertilizer 105	153 100
Lbs of lime applied Index of lime used	227 134	170 100
Per acre of total land area Lbs road salts used Index road salts used	42.15 101	41.74 100
Tons (ton) Kilo	To grams (kg) grams (kg) ic Tons	Multiply By 0.454 907.2 0.907

5.4.2 Materials Usage

The following table lists by county the materials usage inventory for PSA 2.3.

Table 5-51 MATERIALS USAGE (in 1972)

	Chemicals		Commercial	Limestone	Salts	
	Applied	Livestock		Purchased	Applied to	
PSA 2.3	to Crops (100 lbs)	Manure (tons)	on Croplands (tons)	or Applied (tons)	all Highways (tons)	
Indiana						
Elkhart	3292	666549	22251	11224	3094	
Lagrange	2142	770583	24513	8022	3443	
Marshall	3342	460483	36225	15463	6943	
Noble	2534	442088	18492	5783	5699	
St. Joseph	2716	238487	20446	11719	11954	
Steuben	1445	293804	12471	2665	3366	
Michigan						
Allegan	4788	615448	24253	16590	9925	
Barry	1607	389470	10186	14480	5983	
Berrien	12104	201212	25483	14374	10722	
Branch	3031	337563	17594	10598	7829	
Calhoun	2982	487747	19309	15600	7827	
Cass	2556	365178	14810	29198	6572	
Clinton	3063	520553	24211	7881	3701	
Eaton	3084	407995	17648	8232	5983	
Hillsdale	2963	436822	17514	13857	4666	
Ingham	2686	477692	19955	9098	7976	
Ionia	3693	557067	21106	7733	8193	
Jackson	2313	531824	15382	7238	11013	
Kalamazoo	2182	291468	12344	12469	9925	
Kent	6609	466069	17032	13647	27853	
Montcalm	5139	301338	23073	29115	3384	
Ottawa	3236	475138	14827	6096	1340	
St. Joseph	2467	341669	16942	25499	6572	
Shiawassee	2944	344926	20274	4542	4980	
Van Buren	9645	248549	21458	20543	10724	
TOTAL	92563	10669722	487799	321666	189667	
To Convert F	rom		To		tiply By	
Pounds (1b)			ograms (kg)		0.454	
Tons (ton)			ograms (kg)		7.2	
20110 (2011)		Met	ric Tons	0.907		

# 5.4.2.1 Agricultural Chemicals

There were 4,198,500 kilograms (9,256,320 pounds) of agricultural chemicals used in PSA 2.3. Herbicides represented 57 percent of the total, insecticides 17 percent, and fungicides 26 percent. Herbicide use may increase about 10-25 percent in the next 10 years and fungicide use about 5-10 percent. Insecticide use may increase only slightly.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

Lake Michigan 2,0 STATE: Indiana & Michigan PLANNING AREA: \_\_\_ COUNTY: 25 County Totals PLANNING SUBAREA: Southeast 2.3

TARLE	1-ESTIMATED	AMOUNTS	OF	CHEMICATE	HERD	ONE	CROPS	1072

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	1290569	35489.9	286792	4301.5		
Grains	280775	1403.2	93591	935.5		
Hay or Grass Silage	172337	1722.7	143616	1435.5		
Pastured Cropland	119881	1197.7	119881	1197.7		
Other Field Crops	393076	8397.9	37974	1956.5	13556	2033.1
Vegetables	33924	1,658.4	24046	1398.9	23773	1727.8
Orchards						
Berries	63722	29914.9	76540	12394.4	78195	12317.6
Nursery, Greenhouse						
Other Crops						
Totals	0.001 0.01	500/1 n	mod Lo	00/00 0	22660	37000 6
Total Herbicides, In		52864.7		23620.0	325221.8	92563.2

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	718914	72291	72952	145243
1969	714126	66577	73061	139638
1972	814784	84552	84118	168670

Wet Manure Factor: Tons per litter farrowed(combination factor) 7.38
Wet Manure Defecated: Tons, 1972 12hlu156
Nutrients in Wet Manure: Nitrogen, tons 622h Phosphorus, tons Potash, tons\_

#### TABLE 3-MANURE FROM CATTLE

Year 1964	Total	Cows & Heifers Calved	Heifers, Steers,
1964		Carved	Bulls, Calves
	830664	328967	501697
1969	747020	287785	459235
1972	812011	311260	500751
Wet Manure Fac Per Animal	tor: Tons	13.14	6.45
Wet Manure Def	ecated:	4089957	3229814

# TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	197313	
1969	167614	34729
1972	138378	121458
Wet Manure Factor: Tons per animal	1,61 222789	12,78
Wet Manure Defecated: Tons, 1972	222789	12,78
Nutrients in Wet Manure: Nitrogen, Tons	3119	10710
Phosphorus, Tons	1467	1552
Potash, Tons	467 2228	9313

#### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		5527147		
1969		5869112	1 616	
1972	II belle in	1770917	211830	2103360
Wet Manure Factor: 1	bs. per bird	82.9	365.0	89.63
Wet Manure Defecated	Tons, 1972	197756		
	rogen, tons	3085	Combined	132687
	sphorus, tons	791		537
Pota	ish, tons	692		161

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 9000320	Number I-V farms 237	55
Number of farms	41911	Acres in I-V farms 457	3299
Acres in farms	5884857	Cropland I-V farms 356	7494
Cropland in farms	1415831	Harvested cropland	2000
Harvested cropland in fa	rms 2830585	I-V farms 21.7	6345

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	982562	122639	37411	160050
GRAINS	1,561,78	1,71,51	2755	50209
Wheat	256485	29396	2005	31401
Oats	166320	15412	644	16056
Barley	7268	786 866	46	832 898
Rye	15113	866	32	898
OTHER FIELD CROPS	396634	33298	4208	37506
Soybeans	291984	15920	1822	17742
Potatoes	16621	7516	1514	9030
Sugar beets				
Field beans	23248	121	N. C.	121
HAY OR GRASS SILAGE	1,75088	11252	537	11789
PASTURED CROPLAND	1,01,686	1,600	250	4850
Cropland used for pasture	36hh71	3725	230	3955
Improved pasture	40215	875	20	895
VEGETABLES, SWEET CORN, MELONS	38227	11118	625	11.7/13
ORCHARDS	102987	111992	1,68	15460
BERRIES	12171	2613	35	2648
NURSERY & GREENHOUSE PRODUCTS	7921	2110	95	2205
OTHER CROPS	3476	190	15	205
Total Fertilizer Used, Tons		250387	46399	296786
Percent of Fertilizer Used		84	16	100

TABLE 7FERTILIZER	USED IN 1972	TABLE		MESTONE EQUIV	ALENT
Item	Tons		APPLIED Tonnage	Tonnage not	
Pertilizer Used on Crops: Solid	371888	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Total Liquid	115911 487799	1972	158961	162705	321666
Primary Nutrients in Fertilizer		Ton	nages for Oth	er Recent Yea	rs
Nitrogen	75312				
Phosphorus	73002				

#### TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	110174	540.2
1971-72	106340	524.0
1972-73	130770	510.9
Total Estima	ated Tons Applied on All Hi	ghways in 1972-73,

#### TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-TOTAG

Table 1	Herbicid 52864.7	es Inse 23620	cticides .0	Fungicides 16078.5	Total 92563.2
Manure: K	ind of	Tons	of Materials	in Wet Manure	Defecated
Livesto	ck	Manure	Nitrogen	Phosphorus	Potash
Swine: Tal	ole 2	1244456	6224	1743	4725
Cattle: Ta	able 3	7319801	40990	7320	36599
Sheep: Tal	ole 4	222789	311.9	1,67	2228
Horses: Ta	able 4	1552233	10710	1552	9313
Chickens:	Table 5	197756	3085	791	692
Turkeys:	Table 5	132687	2069	531	1,64
Total from Tot	Livestock,	10669722	66197	1.2404	54021
Fertilizers	31	Tons of C		rtilizers Appli	ed
Ite		Total	Prim Nitrogen	Phosphorus	Potasi
A A A					

		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	487799	75312	73002	79295

Lime: Limestone equivalent purchased or applied, tons: Table 8 321666

Salts: Applied on all highways, tons: Table 9 189667

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime a	and E	Highway	De-Icing	Compounds
Or zeaze area						December 1		

PLANNING AREA:	Lake Michigan 2.0	STATE:	Indiana	
PLANNING SURAPEA:	Southeast 2.3	COUNTY:	Elkhant	

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CRO	PS. 1972	3

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	70940	1950.8	15764	236.4		
Grains	11946	59.7	3982	39.8		
Hay or Grass Silage	5880	58.8	4900	49.0		
Pastured Cropland	4713	147.1	4713	47.1	-	
Other Field Crops	30960	619.2	1935	19.3		
Vegetables	220	8.4	220	3.4	220	16.0
Orchards	289	16.1	321	35.8	325	85.0
Berries	-					
Nursery, Greenhouse						Sand B
Other Crops						
Totals	121/91/8	2760.1	31835	130.8	5115	101.0
Total Herbicides, In	secticide	s, Fungio	cides: 10	00 lbs	157328	3291.9

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	42611	4510	4553	9063
1969	47746	3862	4054	7916
1972 (	1) 56582	1,009	5372	9387

1972 (1) 56582	1,009 53	2 9381
Wet Manure Factor: Tons	per litter farrowed	7.636
Wet Manure Defecated: To	ns, 1972	71.633
Nutrients in Wet Manure:	Nitrogen, tons	358
	Phosphorus, tons	100
	Potash, tons	272

(1) 1972 Hog & Pig Inventory for Indiana not available by county. Calculated TABLE 3—MANURE FROM CATTLE here at same rate as litters for the county.

		Number Cattle and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves	
1964	40357	15757	24600	
1969	38619	15532	23087	
1972	(1) 41181	(1) 16563	(1) 24618	
Wet Manure Per Anim	Pactor: Tons	13.14	6.45	
Wet Manure Tons, 19	Defecated:	217638	158786	
	Defecated: Tons, 1972			
Nutrients	in Wet Manure: Nitroge Phosphe	orus, tons 376		
	Potash	tons 188	2	

### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	5746	-
1969	51,06	2407
1972	(1) 4703	9171
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	7572	117201
Nutrients in Wet Manure: Nitrogen, Tons	106	809
Phosphorus, Tons	16	117
Potash, Tons	76	703

#### TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		1,221,95		
1969		81118115		
1972		(1) 703671	102720	1027200
Wet Manure Fa	ctor: Lbs. per bird	82.90	365.0	89.63
wet Manure De	fecated: Tons, 1972	29167		
Nutrients in Wet Manure: Nitrogen, tons		455	Combined 64552 1007	
	Phosphorus, tons	117		258 226
	Potash, tons	102	10.3	226

# (1) State trends applied to county as county figures for 1972 not available.

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047

Salts: Applied on all highways, tons: Table 9 309h

(1) County, land area, acres includes water areas under 40 acres in size,

TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	299156	Number I-V farms 1278
Number of farms	1926	Acres in I-V farms 195713
Acres in farms	225875	Cropland I-V farms 162073
Cropland in farms	182126	Harvested cropland
Harvested cropland in farm	ıs 135927	I-V farms 126140

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	60863	6438	3817	10255
GRAINS	18363	1792	273	2065
Wheat	12627	1282	250	1532
Oats	5283	1472	22	494
Barley	107	9	1	10
Rye	199	11	0	11
OTHER FIELD CROPS	28184	1082	391	11:73
Soybeans	27119	946	336	1282
Potatoes	12	3	0	3
Sugar beets				
Field beans	1403	0	0	0
HAY OR GRASS SILAGE	18455	418	65	483
PASTURED CROPLAND	18852	202	39	241
Cropland used for pasture	17033	177	37	214
Improved pasture	1819	25	2	27
VEGETABLES, SWEET CORN, MELONS	267	64	56	120
ORCHARDS	361	21	20	5
BERRIES	40	14	1	
NURSERY & GREENHOUSE PRODUCTS	356	31.	2	33
OTHER CROPS	120	18	0	18
Total Fertilizer Used, Tons		10070	1,661	21/73/1
Percent of Fertilizer Used		68	32	100

E 8-GROUND LIMESTONE EQUIVALENT

TABLE 7-FERTILIZER US	SED IN 1973	TABLE
ROM SPRING TO PARE 1975 EN ONNACE REPORTS	Tons	
Fertilizer Used on Crops: Solid	12962	Year
Liquid	9289	1972
Total	22251	Ton
Primary Nutrients in Fertilizer	9401	101
Nitrogen	3235	_
Phosphorus	3086	
Potash	3080	

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
1972	31/83	9741	11224
1972 Ton	11/83 mages for Oth	9711 er Recent Yes	

(1) Full year information available for only 1973.
TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2133	NO. OF THE REAL PROPERTY.
Total Estin	nated Tons Applied on All Hig	hways in 1972-73,

## TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	s In	secticides	Fungicides	Total
Table 1	2760.1	43	0.8	101.0	3292.9
Manure: Kind of		Ton	s of Material	s in Wet Manure	
Livesto	ck	Manur		en Phosphorus	
Swine: Table 2		71633	358	100	272
Cattle: Table 3		376424	2108	376	1882
Sheep: Table 4		7572	106	16	76
Horses: Table 4		117201	809	117	703
Chickens: Table 5		29167	455	117	102
Turkeys: Table 5		64552	1007	258	226
Total from Livestock,		666549	4843	984	3261
Fertilizer	8:	Tons of		Fertilizers Appli	ed
				mary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	22251	3235	3086	3080

Agricultural Chemicals	, Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
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PLANNING AREA: Take Michigan 2.0 STATE: Indiana PLANNING SUBAREA: Southeast 2.3 COUNTY: Lagrange

TABLE 1	LESTIMATED	AMOUNTS	OF	CHEMICALS	HISED ON	CROPS	1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	1,9397	1358.4	10977	164.6		
Grains	11761	58.8	3920	39.2		
Hay or Grass Silage	7320	73.2	61.00	61.0		
Pastured Cropland	6811	68.1	6811	68.1		
Other Field Crops	10320	206.h	645	6.4		
Vegetables	68	2.6	68	1.0	68	5.0
Orchards	79	6.6	75	9.0	82	13.5
Berries			world .			
Nursery, Greenhouse						
Other Crops						
Totals	85756	1774.1	28596	349.3	150	18.5

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sows Farrowing		
Year Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	53342	6179	6322	12501
1969	67663	6494	7020	13514
1972	(1) 91971	9756	8613	18369

the factor of the same of the	7.72	-2	20307
Wet Manure Factor: Tons	per litter farrowed	7.636	
Wet Manure Defecated: Ton:	s, 1972	140266	
Nutrients in Wet Manure:	Nitrogen, tons	701	
	Phosphorus, tons	196	
	Potash, tons	533	

# (1) Farrowing trends applied to Inventory figures to get 1972 number -- not

TABLE 3-MANURE	FROM	CATTLE	now	available

		Number Cattle and Calves				
Year Total		Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964 1969	37272 39138	13379 13123	23893 26015			
1972	(1) 11735	(1) 13994	(1) 27741			
Wet Manure Per Anim	Factor: Tons	13.14	6.45			
Wet Manure Tons, 19	Defecated:	183881	178929			
Wet Manure	Defecated: Tons, 1972 in Wet Manure: Nitrog Phosph	Combined: 362810				

#### TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	11049	-
1969	7177	1,723
1972	(1) 621/1	17995
Wet Manure Factor: Tons per animal	1.61	12,78
Wet Manure Defecated: Tons, 1972	10053	229971
Nutrients in Wet Manure: Nitrogen, Tons	21/2	1587
Phosphorus, Tons	21	230
Potash, Tons	101	1380

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	456385		
1969	5/1508		
1972	0) 1,51022	15000	135000
Wet Manure Factor: Lbs. per bird	82.9	365.00	89.63
Wet Manure Defecated: Tons, 1972	18695	307.00	07,03
Nutrients in Wet Manure: Nitrogen, tons	292	Combined 8788	
Phosphorus, tons	75	3	5
Potash, tons	65	3	1

<sup>(1)</sup> State trends applied to county as county figures for 1972 not available.

## TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 2h3776	Number I-V farms 1001
Number of farms	11,66	Acres in I-V farms 181315
Acres in farms	20/175	Cropland I-V farms 13861)
Cropland in farms	153572	Harvested cropland
Harvested cropland in fa	rms 101/167	I-V farms 98149

	Crop	Tons	of Fertilize	rtilizer Used	
Crops	Acres	Dry	Liquid	Total	
CORN	42302	3773	1964	5737	
GRAINS	20719	1564	316	1880	
Wheat	11167	923	216	1139	
Oats	8755	584	98	682	
Barley	1.62	21	.0	21	
Rye	371	17	2	19	
OTHER FIELD CROPS	13276	666 -	211	877	
Soybeans	11683	1488	188	676	
Potatoes	36	111	0	11	
Sugar beets				- Alexander	
Field beans	895	0	0	0	
HAY OR GRASS SILAGE	21636	337	72	409	
PASTURED CROPLAND	27245	184	29	213	
Cropland used for pasture	21,21,8	170	24	194	
Improved pasture	2997	Th	5	19	
VEGETABLES, SWEET CORN, MELONS	83	26	1	27	
ORCHARDS	36	1	1	2	
BERRIES	51	0	0	0	
NURSERY & GREENHOUSE PRODUCTS	0	0	0	0	
OTHER CROPS	149	30	0	30	
Total Fertilizer Used, Tons		6581	2594	9175	
Percant of Fertilizer Used		72	28	100	

# Fertilizer on Crops: Total Primary Nut

(From Ind. Fertilize: Spring to Fall 1973	Reports-	-	APPLIED			
Item	Tons	-	Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	13990	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	10523 24513		1972	2596	5426	8022
Primary Nutrients in Fertilizer	10653	Ton	nages for Oth	er Recent Yea	rs	
Nitrogen	3458					
Phosphorus	3658					
Potash	3537					

Potash 3537
(1) Full year information available for only 1973.

TABLE 9SALTS	APPLIED TO FEDERAL, STATI	E, COUNTY, & MUNICIPAL HIGHWAYS
Year	Tons Purchased Through State	Tons Applied Per
1970-71		
1971-72		
1972-73	2374	
Total Estima	ated Tons Applied on All	Highways in 1972-73,

As Computed 3443

#### TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbici	des Inse	cticides	Fungicides	Total
Table 1 177h.1	31	9.3	18.5	27/11.9
Manure: Kind of	Tons	of Materials	in Wet Manure De	fecated
Livestock	Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2	140266	701	196	533
Cattle: Table 3	362810	2032	362	1814
Sheep: Table 4	10053	1587	21	101
Horses: Table 4	229971	1587	230	1380
Chickens: Table 5	18695	292	75	65
Turkeys: Table 5	8788	137	35	31
Total from Livestock, Tons	770583	4890	919	3924
Fertilizers:	Tons of (	Commercial Fer	tilizers Applied	1
		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	24513	3458	3658	3537

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Salts: Applied on all highways, tons: Table 9 3443

PLANNING AREA: Lake Michigan 2.0 STATE: Indiana PLANNING SUBAREA: Southeast 2.3 COUNTY: Marshall

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	70660	1943.1	15702	235.5		
Grains	7513	37.5	2504	25.0		
Hay or Grass Silage	5130	51.3	4275	42.7		
Pastured Cropland	1,508	45.0	14508 2070	45.0		
Other Field Crops	33120	662.4		20.7		
Vegetables	952	36.5	952	14.7	952	69.3
Orchards			- 64			
Berries	274	20.1	282	34.3	295	59.4
Nursery, Greenhouse						
Other Crops						
Totals	122157	2795.9	30293	417.9	1247	128.7 33li2.

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	60422	6779	6209	12988
1969	61559	5746	5638	11384
1972 (	1) 67015	5641	6176	11817

1972 (1) 67015	50/11	07.10	
Wet Manure Factor: Tons	per litter farrow	red 7.636	
Wet Manure Defecated: Ton	s, 1972	90235	
Nutrients in Wet Manure:	Nitrogen, tons	151	0 111
	Phosphorus, tons	126	
	Potash, tons	3/12	

(1) Farrowing trends applied to obtain this figure for 1972.

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	36093	12493	23600			
1969 1972	32228 (1) 34366	(1) 12273	20719			
Wet Manure Per Anim	Factor: Tons	13,14	6.45			
Wet Manure Tons, 19	Defecated:	161267	142500			

Tons, 1972	1612	67	142500
Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitroge Phospho Potash,	n, tons	303767 1701 304 1519	

TABLE	4MANURE	FROM	SHEEP	AND	HORSES	

Year Item	Sheep & Lambs	Horses & Ponies
1964	6274	
1969	5410	1189
1972	(1) 4707	4530
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	7578	57893
Nutrients in Wet Manure: Nitrogen, Tons	106	399
Phosphorus, Tons	16	58
Potash, Tons	76	347

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year It	em	Chickens	Turkey Hens	Turkeys Raised
1964 1969		240655		
1972		185217	600	6060
Wet Manure Factor: Lbs.	per bird	82.9	365.0	89.63
Wet Manure Defecated: To	ns, 1972	629		
Nutrients in Wet Manure: Nitrogen	, tons	10	Combined 3	81
Phosphor Potash,		3	1	
Total Control of the				

(1) State trends applied to obtain county figures.

	W-21 V	SEDCLASS I-V CENSUS FARMS, 196
COUNTY, land area, acres	(1) 283776	Number I-V farms 1126
Number of farms	1711	Acres in I-V farms 211265
Acres in farms	21,4625	Cropland I-V farms 175102
Cropland in farms	198761	Harvested cropland
Harvested cropland in fa	rms 139980	I-V farms 129302

	Crop	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	Tota
CORN	63130	8828	3973	12801
GRAINS	13351	1593	110	1703
Wheat	9559	1225	98	1323
Oats	3317	330	12	31+2
Barley	36	14	0	14
Rye	439	34	0	34
OTHER FIELD CROPS	36343	2034	221	2255
Soybeans	35757	1942	191	2133
Potatoes	5	3	0	3
Sugar beets				
Field beans	239	0	0	0
HAY OR GRASS SILAGE	15791	525	18	5243
PASTURED CROPLAND	18031	280		288
Cropland used for pasture	16154	261	6	267
Improved pasture	1877	19	2	21
VEGETABLES, SWEET CORN, MELONS	1161	334	97	431
ORCHARDS	206	45	0	45
BERRIES	132	29	0	29
NURSERY & GREENHOUSE PRODUCTS	61	1	0	1
OTHER CROPS	138	1	0	1
Total Fertilizer Used, Tons		13670	4427	18097
Percent of Fertilizer Used		76	24	100

(1) TABLE 7-FERTILIZER USED IN 1973 TABLE 8-GROUND LIMESTONE EQUIVALENT

Heports-Ind.	Tons	
Fertilizer Used on Crops: Solid	19042	
Liquid	17183	ł
Total	36225	H
Primary Nutrients in Fertilizer	17735	
Nitrogen	6886	ď
Phosphorus	4574	
Potash	6275	

APPLIED Tonnage Tonnage not

Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
1972	72 1861 13		15463	
	mages for Oth		rs	
100	mages for our			

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	4787	
Total Estima As Comput	ted Tons Applied on All Hi	ighways in 1972-73,

THE AT MATERIALS AND HICHUAY DE-TOTAG

Table 1	Herbicides		ecticides	Fungicides	Total 3342.5
AND DESCRIPTION OF THE PARTY OF	ind of	Tons		in Wet Manure I	efecated
Livesto		Manure	The second secon	NAME AND ADDRESS OF THE OWNER, WHEN PERSON AND PARTY OF THE OWNER,	Potash
	le 2	90235	1451	126	342
Cattle: Ta		303767	1701	304	1519
Sheep: Tal		7578	106	16	76
Horses: Ta		57893	399	58	347
Chickens:		629	10	3	2
Turkeys:	Cable 5	381	6	2	1
	Livestock,	1,601,83	2673	509	2287
Fertilizer	31	Tons of		rtilizers Applie	d
		Primary Nutrients			
Ite	em.	Total	Nitrogen	Phosphorus	Potasi
Applied on Table 7	Cropland:	36225	6886	145714	6275

Table 8 15463

Salts: Applied on all highways, tons: Table 9 6943

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453

		4	Agricultu	ral Chemi	cals, Manu	res, Fert	ilizers, Lime an	d Highway	De-Icing Co	mpounds	5			
		1	PLANNING	AREA:	Lake Mich	higan 2.0	STATE:	Indian	a		-			
		1	PLANNING	SUBAREA:_	Southeast	t 2.3	COUNTY:	Noble	or Williams					
TABLE 1-ESTIMATED	AMOUNTS O	F CHEMICA	LS USED C	ON CROPS,	1972	100	TABLE 6CRO	P ACREAG	ES & FERTILIZ	ZER USE	DCLASS	I-V	CENSUS FARMS	1969
Crop Group or	Herb:	Amount Used	Insec	Amount Used	Fung	Amount Used	COUNTY, land	rms	1517		Acres	in I		39946
Crops	Treated	100 lbs				100 lbs	Acres in far Cropland in		22700 17122				-V farms 11	7588
Corn	54505	1498.8	12112	181.6					n farms 11351		- Harve		-V farms 10	3159
Grains	11.023	55.1	3674	36.7				-		T				
Hay or Grass Silage Pastured Cropland	5700	57.0	4750 5078	50.7				Crops			cres	Dry	s of Fertili:	
Other Field Crops	20960	419.2	1310	13.1			COUNT	оторо				0.000		
Vegetables	235	9.0	235	3.6	235	17.1	CORN				132 265	5569 1.62L		80
Orchards Berries	006	20.1	001	05.3	000	25.7	Wheat				125	1083		12
Nursery, Greenhouse	206	12.4	55/1	25.3	229	56.6	Oats		and the same	63	18	518		60
Other Crops							Barley			Th		6	1	7
							Rye OTHER FIELD	CROPS		26	807	960	228	11
	-						Soybeans	UNULO			552	789	193	98
				-			Potatoes			3)4		3	0	3
Totals	97707	2102.2	27383	358.5	1,61	73.7	Sugar beet			1	0	-		
Total Herbicides, I		s, Fungio	cides: 1		125554	2534.4	HAY OR GRASS			31	951	319	122	Lili:
TABLE 2 MANUEL TOO	M CUTTATO						PASTURED CRO				312	309		34
TABLE 2-MANURE FRO	H SWINE						Cropland		pasture		597	265	33 33	29
Hog & Pi	2 2	Sumber Sov	ws Farrow	ring			Improved p	asture		1.7	15	lili	0	144
Inventor		L-May 31	June 1-	Nov. 30			VEGETABLES,	SWEET CO	RN, MELONS	28		61	57	11
Year Dec. 1	Spi	ring	Fa	11	Tota	al .	ORCHARDS BERRIES			23		10	9	19
1964 51786	591	6	521	.8	1116	1	NURSERY & GR	EENHOUSE	PRODUCTS	146		3	0	10
1969 44840	1443		450		8933		OTHER CROPS	and the contract of the contra	TRODUCTO	71		2	0	2
1972 (1) 52399	1488	30	555	7	1,04,39	7	Total Fertil	izer Use	d, Tons			8866		12
Nutrients in Wet Ma	Pho Pot ds applied	osphorus, tash, tons	tons	399 112 299 ory for 1	972.		Fertilizer U	1 1973 I rts)	used in 1973 hd. Fertiliz Tons	r	Tonna Governm	IED ige ment	Tonnage not Government	Tota
TABLE 3-MANURE FRO	M CATTLE		22 2	ve a	2015		on Crops:	Liquid	12042	Year 1972			Cost/Shared	Tonna 578
71		-	Number ows & Hei		nd Calves		Total Primary Nuti	ients in	18492	Tor	nages fo	r Oth	er Recent Ye	ars
Year To	tal	CC	Calve			Steers, Calves	Fertilizer		7727					
		_					Nitrogen		2401	_				1
-	3153 0532		12719		2043L 18638		Phosphorus		3398					
1972 (1) 3			(1) 12683		(1) 19875		Potash (1) Full year	informat	1928					
Wet Manure Factor:	Tons		-				for only 1		TOU WASTIRDT					
Per Animal			13.14		6.45		TABLE 9SA	LTS APPL	IED TO FEDERA	L, STA	TE, COUNT	Y, &	MUNICIPAL HI	GHWAYS
Wet Manure Defecate Tons, 1972	d:		1,6665	55	12819	94	Year		Tons Purcha Through St			Tons	Applied Per	
Wet Manure Defecate				294849			1970-71							
Nutrients in Wet Ma		osphorus,		1651 295			1971-72		3929		-			-
		tash, ton		3/17/4			1972-73	-imated '	Tons Applied	on 411	Hi ohways	in I	972-73	
TABLE 4MANURE FRO	M SHEEP AN	ID HORSES						mputed		OII ALL	III giiwaya			
				Sheep &	Horse		TABLE 10-9	UMMARY O	F AGRICULTURA	AL MATE	RIALS AN	D HIG	HWAY DE-ICING	
Year 1964	Item			Lambs	Poni	les	No. of the last	215444	- CA	-1-2 64			//	
1969				13033 8523	01	33	Chemicals:		Hundredweigh					
1972			(1)	7415		555	max a	Herbi		nsecti	cides		mgicides	Tota
Wet Manure Factor:	Tons per	animal		1.61		2.78	Table 1	2102		58.5		-		2534.4
Vet Manure Defecate	d: Tons,	1972		11938	45	5433	Manure: Ki						Vet Manure De	
Nutrients in Wet Ma	nure: Nit	rogen, To		167	31	13	Livestoc Swine: Tab		Manu	re	Nitroger		Phosphorus	Pota
		sphorus,		25			Cattle: Tab		79712		399	-	205	299
	Pot	ash, Tons	5	119	27	(3	Sheep: Tab.		29h8h9 11938		1651 167		295 25	11/7
TABLE 5-MANURE PRO	M CHICKENS	S & THEFT	YS				Horses: Ta	ble 4	45433		313 158		45	273
	- was a second	U LUNKE			Т		Chickens:		10156	_		-	41	36
200000	200000				Turkey	Turkeys	Turkeys: T					-	-	-
Year	Trom		AND A CALL	1000	The state of the s	1000	TOTAL LION	AT AFRICACI	3		The second		Carrier III	

(1) State trends applied to get county figures for 1972.

Phosphorus, tons Potash, tons

Item

Wet Manure Factor: Lbs. per bird Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons

To Convert From Pounds (1b) Acres (acre) Tons (ton)

Chickens

313785

29h166 1) 2h5011

Hens

Combined

To Kilograms(kg) Hectare (ha) Kilograms (kg)

Turkeys Raised

Multiply By 0.453 .4047 907.2

Tons

Item
Applied on Cropland:
Table 7

Fertilizers:

County, land area, acres includes water areas under 40 acres in size.

518

3398

2201

Potash

1928

2688

2401

Tons of Commercial Fertilizers Applied
Primary Nutrients
Total Nitrogen Phosphorus

142088

1.8492

Lime: Limestone equivalent purchased or applied, tons: Table  $8 \ \ 5783$ 

Salts: Applied on all highways, tons: Table 9 5699

Year

1964

1969 1972

PLANNING AREA: Lake Michigan 2.0 STATE: Indiana PLANNING SUBAREA: Southeast 2.3 COUNTY: St. Joseph

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	60076	1652.0	13350	200.2		
Grains	9483	47.4	3161	31.6		
Hay or Grass Silage	3270	32.7	2725	27.2		
Pastured Cropland	211.7	21.1	2117	21.1		
Other Field Crops	28560	571.2	1785	17.8		
Vegetables	460	17.6	460	7.1	460	36.0
Orchards						
Berries	77	5.2	81	9.3	814	18.6
Nursery, Greenhouse						
Other Crops						
Totals	7.0h0h3	2347.2	23679	374.3	211/1	54.6
Total Herbicides, In					128266	

TABLE 2--MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	25659	25118	2549	5097
1969	21,397	2477	2261	4738
1972	(1) 32064	3478	2749	6227
Wet Man	ure Factor: Ture Defecated:	ons per litter f. Tons, 1972	47549	
Nutrien	ts in Wet Manu	re: Nitrogen, to		
		Phosphorus,	tons 67	

(1) Farrowing trends applied to obtain 1972 Inventory.
TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves						
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves					
1964	19598	6971	12627					
1969	21,787	5315	9472					
1972	(1) 15768	(1) 5668	(1) 10100					
Wet Manure Per Anim		13.14	6.45					
Wet Manure Tons, 19	Defecated:	7h478	65145					
	Defecated: Tons, 1972 in Wet Manure: Nitroge Phosphe Potash	en, tons 782 orus, tons 1140	3					

Year Item	Sheep & Lambs	Horses & Ponies
1964	2957	
1969	1840	861
1972	(1) 1601	3280
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2578	41924
Nutrients in Wet Manure: Nitrogen, Tons	36	289
Phosphorus, Tons	5	142
Potash Tons	26	252

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Chickens	Turkey Hens	Turkeys Raised
450000000000000000000000000000000000000		
(1) 164355	-	17.
82.9		
6813		
106	Combined	
27 24	-	-
	178255 197329 (1) 164355 82.9 6813	Chickens Hens  178255 197329 (1) 104355  82.9 6813  106  Combined

(1) State trends applied to obtain 1972 Figure.

TABLE 6-- CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 298h32	Number I-V farms 815
Number of farms	136h	Acres in I-V farms 165800
Acres in farms	194838	Cropland I-V farms 1/22/12
Cropland in farms	163680	Harvested cropland
Harvested cropland in fa	rms 119109	I-V farms 107178

	Crop	Tons o	Tons of Fertilizer U				
Crops	Acres	Dry	Liquid	Tota			
CORN	50534	7046	2925	9971			
GRAINS	13773	1634	178	1812			
Wheat	11137	1369	165	1534			
Oats	2238	243	13	256			
Barley	38	3 16	0	3			
Rye	312		0	16			
OTHER FIELD CROPS	34398	2344	524	2868			
Soybeans	30807	1511	218	1729			
Potatoes	1193	378	123	501			
Sugar beets							
Field beans	294	0	0	0			
HAY OR GRASS SILAGE	8295	341	15	356			
PASTURED CROPLAND	8469	138	26	164			
Cropland used for pasture	8021	131	17	348			
Improved pasture	1448	7	9	16			
VEGETABLES, SWEET CORN, MELONS	561	198	31	229			
ORCHARDS	70	8	0	8			
BERRIES	29	10	0	10			
NURSERY & GREENHOUSE PRODUCTS	251	103:	0	103			
OTHER CROPS	284	0	0	0			
Total Fertilizer Used, Tons		11822	3699	15521			
Percent of Fertilizer Used	The same	76	214	100			

(1) TABLE 7--FERTILIZER USED IN 1973 TABLE 8--GROUND LIMESTONE EQUIVALENT (Spring & Fall 1973 Und. Fertilizer APPLIED

	Tonnage	Tonnage not	
Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
1972	1326	10393	11719
1011	nages for our	CI MCCOIL TON	
-			
-	Ton	Tonnages for Oth	Tonnages for Other Recent Yea

(1) Full year information available for only 1973.

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	8242	
Total Est	imated Tons Applied on All Hi	ghways in 1972-73,

-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbicide			secticides	Fungicides 54.6	Total 2715.1
Table 1	2347.2	314.	.3	24+0	211001
Manure: Kind	lof	Tons	of Materials	in Wet Manure	
Livestock		Manure		Phosphorus	
Swine: Table	2	47549	238	67	181
Cattle: Tabl	e 3	139623	782	140	698
Sheep: Table 4		2578	36	5	26
Horses: Table 4		41.924	289	42	252
Chickens: Ts		6813	106	27	24
Turkeys: Tab		-	-	-	-
Total from Li Tons	vestock.	238487	1451	281	1181
Fertilizers:		Tons of	Commercial Fer	tilizers Applie	ed .
			Prima	ry Nutrients	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7		201116	2880	2983	3334

Salts: Applied on all highways, tons: Table 9 11954

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

# GREAT LAKES BASIN MATERIAL USAGE INVENTORY Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

			1	PLANNING	AREA:		Lake Mi	chigan 2.0	STATE:	Indiana			_				
				PLANNING	SUBARE	A:	Southea	st 2.3		Steuben							
TABLE 1ES	TIMATED A	MOUNTS OF	CHEMICA	LS USED	ON CROI	s, 197	72		TABLE 6CROI	ACREAGE	S & FE	RTILIZE	ER USEI	CLAS	S I-V (	CENSUS FARMS,	1969
		Herbi	cides	Ins	ecticid		Fungi	icides	COUNTY, land	area, ac	res (1)	198016	5	Numbe	er I-V	farms 5116	
Crop Gr	oup	Acres	Amount	Acre	Amor		Acres	Amount Used	Number of far	Number of farms 892					s in I-V farms 1263h3		
Cro	os	Treated	100 lbs		20 0.000		reated	1 277 1900	Acres in far			151750					0
Corn		33211	914.1	7387	110	.8			Harvested cro		farms				I	-V farms 6066	0
Grains		6527	32,6	2176	21.	7							C	гор	Tons	s of Fertiliz	er Used
Hay or Gras		1710 3802	147.1	3925	39. 38.	2				Crops				cres	Dry		Tota
Other Field		9360	187.2	585	5.8				CORN				2571	19	3176	830	1,006
Vegetables		82	3.1	82	1.3		82	6.0	GRAINS				107	07	1091	51	111/2
Orchards Berries		0	0	0	0		0	0	Wheat Oats				658 363		732 31h	18	765 332
Nursery, Gre									Barley				120		16	0	16
Other Crops			-	-	-	-	-		Rye				183	0	7 718	17	7 765
									OTHER FIELD Soybeans	CROPS			991		428	43	1471
						-			Potatoes				338		271	0	271
Totals		57722	1222.1	17957	216	.8	82	6.0	Sugar beet				273		0	0	0
Total Herbi	cides, In	secticide	s, Fungi	cides:	100 1ь		75761	7/1/1/1-9	Field bean			_	143		137	11	148
TABLE 2MA	NUMP FROM	SWINE							PASTURED CRO				152		120	18	138
ENDAM 6 TH	TANK BANGE								Cropland u		asture		938		107	18	125
	Hog & Pig	Color Color	Number Sc L-May 31		owing 1-Nov.	30			VEGETABLES,		RN, MEL	ONS	100		59	2	61
Year	Inventory Dec. 1		ring		Fall	-	Tot	al	ORCHARDS				8		0	0	0
1964	22823		72	1 2	173		li6h	5	BERRIES NURSERY & GR	EENHOUSE	PRODUC	TS	0		0	0	0
1969	19358	20	061		955		401	6	OTHER CROPS				88		1	0	6261
	1972 (1) 25253 2488 2751						Total Fertil Percent of F						5302	959	100		
	Wet Manure Factor: Tons per litter farrowed 7.636 Wet Manure Defecated: Tons, 1972 40005										-						
Nutrients i				tons	200				(1) TABLE 7-FER	TILIZER U	USED IN	1973	TABLE	8GRC	DUND LI	MESTONE EQUIV	ALENT
		Pho	osphorus	, tons_	56	4			Tonnage Ranc	rts)	Tons		r	API	PLIED	Marine and the said	
	Potash, tons 152 (1) Farrowing trends applied to obtain 1972 Inventory.								LOILS				nage	Tonnage not Government	Total		
	alton Live	mark Steren	I to obta	ain 1972	Invent	ory.			Fertilizer U		1171	2	Year	Cost/S	Shared	Cost/Shared	- AND CONTRACTOR
TABLE 3-MA	NURE FROM	A CATTLE		_	-		-			Liquid	761		1972	56		2099	2665
							Calves		Total Primary Nutr	fonto in	121/7	1				er Recent Ye	ars
		- 1		Cows & I	eifers			, Steers,	Fertilizer	Tents In	6707						
Year	Tot					-			Nitrogen		1604		_				
1964	233			91,08 80h			1305		Phosphorus Potash		2131						
1972	(1) 225			(1) 8579		(	1) 1392		1								
Wet Manure	Factor:	Tons		-					TABLE O. CAL	TC ADDIT	ED TO	UWDERAT	STAT	CE COII	NTY. &	MUNICIPAL HI	GHWAYS
Per Anima	1		-	13.14 6.45				IADLE 9SA	TABLE 9SALTS APPLIED TO FEDERAL			uy was	1000				
Wet Manure		d:		112728 89810			0	****	Tons Purcha					Tons	Applied Per "E" Mile		
Tons, 197			1070 0			-			Year Through State			ace			E IIIIC		
Wet Manure Nutrients					20253	8			1970-71 1971-72	_					_		
INGELECTED .	III HOU ING	Ph	osphorus	, tons_	203				1972-73		232						
		Po	tash, to	ns	1013.					timated 7		plied	on All	Highwa	ys in	1972-73,	
- Variable Co.									As Co	mputed	3300						-
TABLE 4M	NURE FRO	M SHEEP A	ND HORSE	S		-	1		1								
				-		рδ		ses &	TART P 10	O VRAMMIS	F AGRI	CULTURA	AL MATE	RIALS A	AND HIG	GHWAY DE-ICIN	3
Year		Item			La	nbs	Por	nies	I I I								
1964					909				Chemicals:		Hundre	-		ied on	1	THE RESERVE OF THE PARTY OF THE	
1969	-				(1) 590			731		Herbio		I	nsecti			ungicides 6.0	Total
	Wet Manure Factor: Tons per animal			1.0			2.78	Table 1	1222	.1		216.8					
Wet Manure					95	2	1 3	15592 146	Manure: Ki			Manu		Materia		Wet Manure De Phosphorus	Potasi
	Nutrients in Wet Manure: Nitrogen		trogen,		13; 20		2	246	Swine: Tab			1,0005	-	200		56	152
			osphorus tash, To		95		2	36	Cattle: Ta	ble 3		202538		1134		203	1013
									Sheep: Tab Horses: Ta			9512 35592		246		36	21/1
TABLE 5-M	ANURE FRO	M CHICKEN	IS & TURE	CEYS	-	_			Chickens:	Table 5		3951		62		16	14
						Opt.	urkey	Turkeys	Turkeys: T	able 5		2206		34	-	9	8
Year		Item		Chi	ckens		Hens	Raised			1	293801		1.809		340	1496
1964				35	875				Fertilizers	_		Tons o	f Comm	ercial	Fertil	izers Applied	i
1969				17	137							0/0/00-00		Pı	rimary	Nutrients	
1972				(1) 95			10	35100	Applied on			Total	N	itroger	n	Phosphorus	Potasi
Wet Manure Wet Manure	Pactor:	Lbs. per	1972	82	4.1	36	5.0	89.63	Table 7	orohrand		12471		1604		2131	2972
Nutrients			2712	39	-	Comb	ined	2206	Lime: Lime	stone eq	uivaler	nt purc	hased	or appl	lied, t	tons:	
	Nitrogen, tons 62					S CONT	STATE OF THE PARTY	3/4	Tab1	e 8 2	665		The state of the s	CO (5.5)	100000		

To Kilograms(kg) Hectare (ha) Kilograms (kg)

Salts: Applied on all highways, tons: Table 9 3366

Multiply By

0.453 .4047 907.2

(1) County, land area, acres in-includes water areas under 40 acres in size.

(1) State trends applied to obtain county figure.

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

PLANNING AREA:	Lake Michigan 2.0	STATE:	Michigan	10
PLANNING SUBAREA:		COUNTY:	Allegan	

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

es ted 0 :	Amount Used 100 lbs 1744.9 52.7 107.8	Acres Treated 14100 3512	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
6	52.7				
7		3512			
	107 8		35.1		
	TO 1 . O	8980	89.8		
	58.2	5816	58.2		
	50.2	1506	169.8		
	156.7	2509	243.5	2219	143.9
	215.3	6113	529.8	6117	921.1
- // 0					
69	2385.8	h2536	1337.7	8336	1065.0

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	26691	2771	2435	5206
1969	45404	31.65	2947	6112
1972	16700	41.00	3300	7400

Wet Manure Factor: Tons per litter
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves			
1964	42088	17270	24818			
1969	43013	17397	25616			
1972	147000	18900	28100			
Wet Manure F Per Animal	actor: Tons	13.14	6.45			
Wet Manure D Tons, 1972		248346	181245			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	3335	197
1969	4965	1515
1972	4100	6022
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	6601	76961
Nutrients in Wet Manure: Nitrogen, Ton	s 92	531
Phosphorus, T		77
Potash, Tons	66	462

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		912515		
1969		680989		
1972		720700	30000	300000
Wet Manure Fac	tor: Lbs. per bird	82.9	365	89.63
wet Manure Def	ecated: Tons, 1972	29873		
Nutrients in V	Met Manure: Nitrogen, tons	466	Combined	18920 295
	Phosphorus, tons	119	_	76
	Potash, tons	105		66

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	s (1) 528512	Number I-V farms	1414
Number of farms	2470	Acres in I-V farms	
Acres in farms	275743	Cropland I-V farms	161167
Cropland in farms	21011/8	Harvested cropland	
Harvested cropland in f	arms 132903	I-V farms	115412

	Crop	Tons	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	Tota	
CORN	51054	6575	1622	8197	
GRAINS	19306	2112	33	23115	
Wheat	9202	1129	24	1153	
Oats	6903	728	6	734	
Barley	438	51	2	53	
Rye	583	28	1	29	
OTHER FIELD CROPS	1889	383	365	748	
Soybeans	334	10	8	18	
Potatoes	1474	365	357	722	
Sugar beets					
Field beans	892	8	0	8	
HAY OR GRASS SILAGE	28669	708	11	719	
PASTURED CROPLAND	18011	121	5	126	
Cropland used for pasture	16331	112	1	116	
Improved pasture	1680	9	1	1.0	
VEGETABLES, SWEET CORN, MELONS	3563	11/45	69	1514	
ORCHARDS	9216	1390	29	71/19	
BERRIES	1083	180	0	180	
NURSERY & GREENHOUSE PRODUCTS	463	140	19	159	
OTHER CROPS	102	5	0	5	
Total Fertilizer Used, Tons		13067	27/18	15215	
Percent of Fertilizer Used		86	16	100	

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

		14.	APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	20373	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	3880	1972	8295	8295	16590
Total	21:253		page For Oth	er Recent Yes	rs
Primary Nutrients in Fertilizer	11884	400	inages for our	CI MCCHC 100	
Nitrogen	3922				
Phosphorus	3803				
Potash	4159				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	6113	30.3
1971-72	5734	28.9
1972-73	6843 ted Tons Applied on All Hi	32.0

	Herbicides	Ins	ecticides	Fungicides	Total
Table 1	2385.8	133	7.7	1065.0	1788.5
Manure: Kind	of	Tons	of Material	s in Wet Manure I	
Livestock		Manure		n Phosphorus	
Swine: Table	2	53502	268	75	203
Cattle: Table	2 3	429591	5/106	430	27/18
Sheep: Table		6601	92	14	66
Horses: Table		76901	531 466	77	462
Chickens: Tal	ole 5	29873	466	119	105
Turkeys: Tabl		18920	295	76	66
Total from Li		615148	4058	791	3050
Fertilizers:		Tons of	Commercial F	ertilízers Applie	d
				mary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on Cro	opland: 2	14253	3922	3803	4159

Salts: Applied on all highways, tons: Table 9 9925

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA	Lake Michigan 2.0	STATE:	Michigan	
PLANNING SUBA	REA: Southeast 2.3	COUNTY:_	Barry	

PARTY 1 POTTMATER AMOUNTS OF CHEMICALS HISER ON CROPS. 1972

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs		Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	33660	925.6	71:80	112,2		
Grains	7722	38.6	2574	25.8		
Hay or Grass Silage	8366	B3.6	6972	69.8		
Pastured Cropland	5780	57.8	5780	57.8		
Other Field Crops	2685	64.6	552	49.8	422	63.2
Vegetables	299	21.4	270	24.8	260	11.7
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	58512	1191.6	2362A	370.5	682	74.9
Total Herbicides, In				00 lbs	82822	1606.7

TABLE	2MANURE	FROM	SWINE	į.

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	15131	11,80	1/127	2897
1969	15051	1645	1407	3052
1972	15500	2200	1600	3800

Wet Manure Factor: Tons Wet Manure Defecated: Ton		7.23	
Nutrients in Wet Manure:		137	
MACAACHES AN HELPHONES	Phosphorus, tons	38	
	Potash, tons	104	

TABLE 3-MANURE FROM CATTLE

		Number Cattle	Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	31710	12479	19231			
1969	28905	11108	17797			
1972	31,600	12100	19500			
Wer Manure 1 Per Animal	Factor: Tons	13.14	6.45			
Wet Manure 1		158994	125775			
	Defecated: Tons, 19					
Nutrients in	Wet Manure: Nitr	ogen, tons 1595				
		phorus, tons 285 sh, tons 11/21				

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	10118	
1969	8150	1063
1972	6600	h30h
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	10626	55005
Nutrients in Wet Manure: Nitrogen, Tons	1119	380
Phosphorus, Tons	106	55
Potash, Tons	106	330

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	130735		
1969	146758		
1972	127600	10000	1,00000
Wet Manure Factor: Lbs. per bird	82.9	365	89.63
Wet Manure Defecated: Tons, 1972	5289		-
Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons	83 21 19		6307 98 25 22

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, a	(1) 350688	Number I-V farms 664
Number of farms	1301	Acres in I-V farms 11,2089
Acres in farms	198205	Cropland I-V farms 106229
Cropland in farms	11:0566	Harvested cropland
Harvested cropland in	farms 103015	I-V farms 67110

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	25875	2888	748	3636
GRAINS	14824	1430	2	1432
Wheat	7212	771	1	772
Oats	6512	569	0	569
Barley	232	25	0	25
Rye	161	8 -	0	8
OTHER FIELD CROPS	2932	262	150	412
Soybeans	1021	80	1	81
Potatoes	1422	84	110	194
Sugar beets				
Field beans	1127	20	0	20
HAY OR GRASS SILAGE	22301	522	0	522
PASTURED CROPLAND	16871	191	14	1.95
Cropland used for pasture	15636	174	4	178
Improved pasture	1235	17	0	17
VEGETABLES, SWEET CORN, MELONS	460	91	14	95 144 6
ORCHARDS	274	6	0	lili
BERRIES	21		0	6
NURSERY & GREENHOUSE PRODUCTS	41	2	0	2
OTHER CROPS	48	2	0	2
Total Fertilizer Used, Tons		51458	908	6366
Percent of Fertilizer Used		86	14	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

TABLE /FERILLIZER	1	APPLIED	1802000		
Item	Tons		Tonnage	Tonnage not	-
Fertilizer Used on Crops: Solid	8556	Year	Government Cost/Shared	Government Cost/Shared	Total
Liquid	1630	1972	11630	2850	11980
Total	10186	Tonnages for Other Recent Years			
Primary Nutrients in Fertilizer	4991	100	mages for our	THE COME TO	-
Nitrogen	1647				
Phosphorus	1597				
Potash	1747				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	4279	29.9
1971-72	4322	29.8
1972-73	1/125	30.8
Total Est	timated Tons Applied on All H	ighways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1 Herbici		secticides 40.2	Fungicides 74.9	Total 1606.7
Manure: Kind of	I Ton	s of Material	s in Wet Manure	Defecated
Livestock	Manuz	the second secon		
Swine: Table 2	27474	1,29	110	96
Cattle: Table 3	284769	1569	285	1424
Sheep: Table 4	10626	149	22	106
Horses: Table 4	55005	380	55	330
Chickens: Table 5	5289	83	21	19
Turkeys: Table 5	6307	98	25	22
Total from Livestock, Tons		2734	518	1997
Fertilizers:	Tons of		ertilizers Appli	ed
		Pri	mary Nutrients	
Item	Total	Nitrogen	Phosphorus	Potasi
Applied on Cropland: Table 7	10186	1647	1597	1747

Lime: Limestone equivalent purchased or applied, tons: Table 8 114180

Salts: Applied on all highways, tons: Table 9 5983

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

PLANNING AREA:	Lake Michigan 2.0	STATE:	Michigan	
PLANNING SUBAREA:	Southeast 2.3	COUNTY:	Berrien	

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972	

	Herbi	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	
Corn	29970	821.2	6660	99.9			
Grains	7152	35.8	2381	23.8			
Hay or Grass Silage	2891	28.9	2112	24.1			
Pastured Cropland	2207	22.0	2207	22.0			
Other Field Crops	1521h	305.2	1050	21.4	105	15,8	
Vegetables	7163	281.8	3876	157.3	5087	121.4	
Orchards							
Berries	24961	1138.4	30042	5221.7	30856	3460.0	
Nursery, Greenhouse	Malaconce						
Other Crops							
m_1_1_	00000	0/0/ 0	10/22	P220 0	2601.0	3907.0	
Totals Total Herbicides, In	89561	2636.3	48631	5570.2 0 1bs	36048 174240	3897.2	

#### TABLE 2--MANURE FROM SWINE

Hog & Pig		Number So		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	225/15	2120	1935	4055
1969	19004	11,99	1772	3271
1972	19600	2000	2000	4000

1312	19000	2000	2000	1 4000	_
Wet Manure	Factor: Tons	per litter fa	rrowed 7.23		
Wet Manure	Defecated: To	ns, 1972	28920		
Nutrients i	n Wet Manure:	Nitrogen, to	ns 145		
And the second		Phosphorus,	tons ho		
		Potash, tons	110		

### TABLE 3-MANURE FROM CATTLE

		Number Cattle	er Cattle and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	11,762	6099	8663		
1969	10784	4214	6570		
1972	11800	4600	7200		
Wet Manure Per Animal	actor: Tons	13,14	6.45		
Wet Manure I Tons, 1972		60hhh	46440		
	Defecated: Tons, 1972 Wet Manure: Nitroge Phospho Potash,	n, tons 599 rus, tons 107			

# TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	964	
1969	1022	1816
1972	800	1591
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1288	58673
Nutrients in Wet Manure: Nitrogen, Tons	18	405
Phosphorus, Tons	3	59
Potash, Tons	13	352

# TABLE 5-MANUER FROM CHICKEN

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		132525		
1969		125/15		
1972		131400		
Wet Manure Fact	or: Lbs. per bird	82.9		
met manure Defe	cated: Tone 1972	Shli7		
Nutrients in We	Manure: Nitrogen, tons	85	Combined	
	Phosphorus, tons	22		
	Potash, tons	19		in .

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1) 3710  Number of farms 2513  Acres in farms 2158  Cropland in farms 1673  Harvested cropland in farms 1120	Acres in I-V farms 171736  Cropland I-V farms 137344  Harvested cropland				
	Crop	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total	
CORN	22468	3211	705	3916	
GRAINS	10690	1222	9	1231 804	
Wheat	6679	798	6	BOL	
Oats	2623	301 55 31 812	3	304 56 31 872	
Barley	399 634	55	1 0 60	56	
Rye	634	31	0	31	
OTHER FIELD CROPS	12506	812	60	872	
Soybeans	12361	752	59	811	
Potatoes	105	144	1	45	
Sugar beets					
Field beans	1415	0	1	0	
HAY OR GRASS SILAGE	7296	241		242	
PASTURED CROPLAND	6587 5652	171	13	184	
Cropland used for pasture	5652	151	13	164	
Improved pasture	935	20		20	
VEGETABLES, SWEET CORN, MELONS	6858	1.943	38	1981	
ORCHARDS	35602	6388	111	6499	
BERRIES	3880	831	6	6499 852 140	
NURSERY & GREENHOUSE PRODUCTS	1014	1.34	6	3710	
OTHER CROPS	48	20	0	10	
Total Fertilizer Used, Tons		14963	964	15927	
Percant of Fertilizer Used		94	6	100	

TABLE 7FERTILIZER USED IN 1972		TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	21/106	Year	Government Cost/Shared	Government	Total Tonnage
Liquid	4077	1972	1/312	10062	14374
Total	25483			er Recent Yea	
Primary Nutrients in Fertilizer	12487	100	mages tot our	CL MILLIE FEE	-
Nitrogen	4121				-
Phosphorus	3996				
Potash	1,370				

# TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	7054	29.0 28.6
1971-72	6870	28.6
1972-73	7393	29.2
Total Estimate	d Tons Applied on All Hi	ghways in 1972-73,

Herbicide	es Inse	ecticides	Fungicides	Total
Table 1 2636.3	557	0.2	3897.2	12103.7
Manure: Kind of	Tons	of Materials	in Wet Manure D	
Livestock	Manure Nitroge			Potash
Swine: Table 2	28920	451	116	101
Cattle: Table 3	106884	599	107	531
Sheep: Table 4	1288	18	3	13
Horses: Table 4	58673	405	59	352
Chickens: Table 5	51,47	85	22	19
Turkeys: Table 5	0	0	0	0
Total from Livestock, Tons	201212	1558	307	1019
Fertilizers:	Tons of		tilizers Applie	d
		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	25483	4121	3996	1,370

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Salts: Applied on all highways, tons: Table 9 10722

					TERIAL USAGE INV				
A	gricultur	al Chemic	als, Manu	res, Fertil	izers, Lime and	Highway De-Ic	ing Compounds		
P	LANNING A	REA:	Lake Mich	igan 2.0	STATE:	Michigan			
P	LANNING S	UBAREA:	Southeast	2.3	COUNTY:	Branch			
CHEMI CAL	S USED ON	CROPS, 1	972		TABLE 6CROP	ACREAGES & FI	ERTILIZER USED-	-CLASS I-V CENSUS FA	RMS, 1969
ides	Insect	icides	Fungi	cides	COUNTY, land	area acres	323776	Number I-V farms	865
Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Number of far Acres in farm Cropland in f	ms	1632 262935 193437	Acres in I-V farms Cropland I-V farms Harvested cropland	153921
2011.8	16500	247.4			Harvested cro	pland in farm	s_119727	I-V farms_	103783

CORN GRAINS Wheat Oats

Barley

Soybeans Potatoes

ORCHARDS BERRIES

Rye OTHER FIELD CROPS

Sugar beets
Field beans
HAY OR GRASS SILAGE
PASTURED CROPLAND

Cropland used for pasture

Improved pasture VEGETABLES, SWEET CORN, MELONS

NURSERY & GREENHOUSE PRODUCTS OTHER CROPS Total Fertilizer Used, Tons

Percent of Fertilizer Used

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	71,250	2011.8	16500	247.4		
Grains	11370	56.8	3790	37.9		
Hay or Grass Silage	52/19	52.4	113711	43.8		
Pastured Cropland	1:31:0	43.4	4340	43.4		
Other Field Crops	22407	148.2	1408	14.9	8	1.2
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	117616	2612.6	30112	387.4	8	1,2
Total Herbicides, In				00 lbs	148036	3031.2

TABLE	2MANURI	FROM	SWINE

TARLE 1 -- ESTIMATED AMOUNTS OF

	Hog & Pig	Number So		
ear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	33829	3389	3292	6681
969	35480	2856	3263	6119
1972	36500	3700	3600	7300

1972	36500	3700	360	0	7300
Wet Manure	Factor: Tons	per litter	farrowed	7.23	
	Defecated: Ton			52779	
Nutrients :	In Wet Manure:	Nitrogen,	tons	264	
		Phosphorus	, tons	74	
		Potash, tor	is	201	

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	29992	12388	17604			
1969	23981	8961	15020			
1972	26200	9800	16400			
Wet Manure l	factor: Tons	13.14	6.45			
Wet Manure 1		128772	105780			
	Defecated: Tons, 1972		2			
Nutrients 1	Wet Manure: Nitrog	en, tons 1313 orus, tons 235				
		, tons 1173				

TABLE 4--MANURE FROM SHEEP AND HORSES

Sheep & Lambs	Horses & Ponies
11027	
12138	1137
9900	2502
1.61	12.78
15939	31976
223	221
33	32
159	192
	11027 12138 9900 1.61 15939

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	104345		
1969	67101		
1972	55900		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	2317		
Nutrients in Wet Manure: Nitrogen, tons	36	Combined	
Phosphorus, tons Potash, tons	8		

ABLE	7-FERTILIZER	USED	IN	1972	TABLE	8GROUND	LIM

Crops

TABLE 7-FERTILIZER	USED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT			
Item	Tons		Tonnage	Tonnage not				
Fertilizer Used on Crops: Solid	11,779	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage			
Liquid	2815	1972	8152	21/16	10598			
Total	17594	Tonnages for Other Recent Years						
Primary Nutrients in Fertilizer	8621	101	mages ava ver		-			
Nitrogen	2845				-			
Phosphorus	2759							
Potash	3017							

Crop Acres

15905

1576 14229 14575

13117

1074

5 384

33 38 9283

I-V farms 103783 Tons of Fertilizer Used
Dry Liquid Total

1450

29

1997 1198 512

33

28

1153

413 100 96

14 37 15

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Tons Purchased Through State	Tons Applied Per "E" Mile
6574	36.2
4869	25.5
	26.5
ed Tons Applied on All H	ighways in 1972-73,
	Through State 6574

CIDAGADY OF ACRICIC TIPAL MATERIALS AND HIGHWAY DE-ICING

Herbicid		es Insec		icides	Fungicides	Total	
Table 1	2642.6		38	7.4	1.2	3031.2	
Manure: Ki	ind of	To	ons of	Materials :	in Wet Manure Defecated		
Livesto	ck-	Manure		Nitrogen	Phosphorus	Potash	
Swine: Tab	ole 2	52779		823	211	185	
Cattle: Ta	able 3	234552		1313	235	1173	
Sheep: Tal		15939		223	33	159	
Horses: Table 4		31976		221	32	192	
Chickens: Table 5		2317		36	9	8	
Turkeys: Table 5		0		0	0	0	
Total from Livestock, Tons		337563		2616	520	1717	
Fertilizer	9:	Tons (	of Cor	nmercial Fer	tilizers Applie	d	
					ry Nutrients		
Ite	em	Total		Nitrogen	Phosphorus	Potasi	
Applied on Table 7	Cropland:	17594		2845	2759	3017	
	estone equiv		chase	d or applied	, tons:		

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan

PLANNING SUBAREA: Southeast 2.3

COUNTY: Calhoun

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	
Corn	69300	1905.7	15400	231.0		
Grains	15330	76.6	5110	51.1		
Hay or Grass Silage	7991	79.9	6659	66.6	100	
Pastured Cropland	7863	78.6	7863	78.6	2/	
Other Field Crops	6252	130.1	773	50.5	408	61.2
Vegetables	11.64	74.2	761	41.9	721	56.3
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	107900	23/15.1	36566	519.7	1129	117.5

ec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
		Torat
2545	2568	5113
2361	2768	5129
3100	3100	6200
	2361	2361 2768 3100 3100

TABLE	3-MANURE	FROM	CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves
1964	42092	14750	27342
1969	37911	12750	25194
1972	41500	13600	27900
Wet Manure   Per Animal	Factor: Tons	13.14	6.45
Wet Manure I		178704	179955

# TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	8281	
1969	10192	1578
1972	8300	5200
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	13363	66456
Nutrients in Wet Manure: Nitrogen, Tons	187 28	1,86
Phosphorus, Tons	28	66
Potash, Tons	134	399

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	151245		
1969	104531		
1972	107200		
Wet Manure Factor: Lbs. per bire	82.9		
Wet Manure Defecated: Tons, 1977	2 111113		
Nutrients in Wet Manure: Nitrogen, tons	69	Combined	
Phosphorus, tons	в 18		
Potash, tons	16		2

TABLE 6 CROP ACREAGES & FERTILIZER USEDCLASS I-V CENSUS FARMS, 1969	TARLE 6CROP	ACREAGES &	FERTILIZER	USEDCLASS	I-V	CENSUS	FARMS,	1969
---	-------------	------------	------------	-----------	-----	--------	--------	------

COUNTY, land area, acres	L) h5382h		er I-V far		B52	
Number of farms	1725		s in I-V			
Acres in farms	289277		land I-V		16060	8
Cropland in farms	2075/17	Harv	ested crop			
Harvested cropland in fa	rms 119787		1-V	rarms_	10290	3
		Crop	Tons of	f Fert	ilizer	Used
Course		Arres	Drv	Lia	h h	Total

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	46415	5707	1464	7171
GRAINS	26679	2739	247	2986
Wheat	13962	1639	11/3	1782
Oats	11334	995	95	1090
Barley	374	33	1	3l <sub>4</sub> 36
Rye	500	36 658	0	36
OTHER FIELD CROPS	6553		32 25	690
Sovbeans	5708	363	25	388
Potatoes	1408	570	2	242
Sugar beets				
Field beans	936	0 _	0	0
HAY OR GRASS SILAGE	20943	547	22	569
PASTURED CROPLAND	25912	220	5	225
Cropland used for pasture	23681	198	5	203
Improved pasture	2231	55	0	22
VEGETABLES, SWEET CORN, MELONS	11:05	270	11	281
ORCHARDS	606	51	37	88
BERRIES	19		0	6
NURSERY & GREENHOUSE PRODUCTS	324	148	14	52
OTHER CROPS	29	0	0	0
Total Fertilizer Used, Tons		10246	1822	12068
Percent of Fertilizer Used		85	5	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

Industry Taxas Industry		1.200	APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	16220	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	3089	1972	13925	1675	15600
Total	19309	Ton	nages for Oth	er Recent Yea	rs
Primary Nutrients in Fertilizer	9461	201			-
Nitrogen	3122				
Phosphorus	3028				
Potash	3311				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per
1970-71	6574	36.2
1971-72	1,868	25.5
1070 72	5397	26.5
Total Estima As Comput	ted Tons Applied on All H	ighways in 1972-73,

# TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide 2345.1	s Ir	secticides 519.7	Fungicides 117.5	Total 2982.3
Manure: K	ind of	Tor		ls in Wet Manure	Defecated
	ble 2	1/1826 358659	699	179 359	157
Cattle: Ta	ble 4	13363	187	28 66	134
Horses: T. Chickens:	Table 5	1,1,113	69	18	16
Turkeys: Total from To	Livestock,	487747	31419	650	2499
Fertilizer	s:	Tons of		Fertilizers Appli Imary Nutrients	ed
It	em	Total	Nitrogen		Potash
Applied on Table 7	Cropland:	19309	3122	3028	3311

Salts: Applied on all highways, tons: Table 9 7827

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Tcing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan
PLANNING SUBAREA: Southeast 2.3 COUNTY: Cass

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	14730	1230.0	9940	149.1		
Grains	8712	43.5	2904	29.0		
Hay or Grass Silage	4533	145.3	3778	37.7		
Pastured Cropland	4505	45.0	4505	45.0		
Other Field Crops	9611	193.1	696	17.5	101	15.1
Vegetables	1986	79.4	1488	63.8	1196	66.0
Orchards						
Berries	1232	57.9	1456	137.8	1458	301.0
Nursery, Greenhouse				2010		-
Other Crops						
Totals	75309	1694.2	21.767	479.9	2755	382.1

#### TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	62501	4010	7846	11856
1969	71520	6570	10751	17321
1972	73600	8600	11900	20500

 Wet Manure Factor:
 Tons per litter farrowed
 7.23

 Wet Manure Defecated:
 Tons, 1972
 11.8215

 Nutrients in Wet Manure:
 Nitrogen, tons
 7hh

 Phosphorus, tons
 208

 Potash, tons
 563

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves			
1964	19175	7540	11.635			
1969	17134	6314	10820			
1972	18700	6800	11900			
Vet Manure Per Anima		13.14	6.45			
Wet Manure Tons, 197		89352	76755			
	Defecated: Tons, 19					

# TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	6242	
1969	5929	1153
1972	4800	2856
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	7728	36500
Nutrients in Wet Manure: Nitrogen, Tons	108	252
Phosphorus, Tons	16	37
Potash, Tons	77	219

### TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	158405		
1969	153600		
1972	159900		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	6628		
Nutrients in Wet Manure: Nitrogen, tons	103	Combined	
Phosphorus, tons	27		
Potash, tons	23		-

TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	313984	Number I-V farms 676
Number of farms	1268	Acres in I-V farms 162155
Acres in farms	206072	Cropland I-V farms 122962
Cropland in farms	150151	Harvested cropland
Harvested cropland in farm	s 89244	I-V farms 7907h

	Crop	Tons	of Fertilize	er Used
Crops	Acres	Dry	Liquid	Tota
CORN	36665	4375	21/1/3	5818
GRAINS	15399	1/137	72	1509
Wheat	8123	816	61	877
Oats	5871	511	6	520
Barley	557	57	0	57
Rye	529	20	6	26
OTHER FIELD CROPS	10710	618	101	719
Soybeans	10505	554	93	647
Potatoes	101	46	2	148
Sugar beets				
Field beans	838	0	0	0
HAY OR GRASS SILAGE	12206	206	16	222
PASTURED CROPLAND	15770	226	16	2112
Cropland used for pasture	11/126	194	16	210
Improved pasture	1644	32	0	32
VEGETABLES, SWEET CORN, MELONS	1693	Lioli	28	1,32
ORCHARDS	2033	257	9	266
BERRIES	157	31	0	31
NURSERY & GREENHOUSE PRODUCTS	28	1	0	1
OTHER CROPS	45	16	0	16
Total Fertilizer Used, Tons		7571	1685	9256
Percent of Fertilizer Used		82	18	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

TABLE /FERTILIZER	DOED IN 197	TABLE	APPLIED	THESTONE EQUIV	MINDIAL		
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	121/10	Government Gover	Government Gov	Government		nt Government Tot	Total Tonnage
Liquid	2370	1972	9198	20000	29198		
Total	14810						
Primary Nutrients in		Ton	nages for Oth	er Recent Yea	rs		
Fertilizer	7257				~		
Nitrogen	2395						
Phosphorus	2322						
Potash	25/10						

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	5472	29.4
1971-72	4829	26.2
1972-73	4531	23.0
Total Estima As Comput	ted Tons Applied on All Hi ed 6572	Ighways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide 1694.2		ticides 479.9	Fungicides 382.1	Total 2556.2
Manure: K	ind of	Tons	of Material	s in Wet Manure De	fecated
Livesto	ck	Manure	Nitroger	n Phosphorus	Potash
Swine: Tal	ole 2	148215	2312	593	519
Cattle: To	able 3	166107	930	166	831
Sheep: Tal	ole 4	7728	108	16	17
Horses: Ta	able 4	36500	252	37	219
Chickens:	Table 5	6628	103	27	23
Turkeys:	Table 5	0	0	0	0
Total from Tor	Livestock,	365178	3705	839	1609
Fertilizers	11	Tons of Co		ertilizers Applied	
Tre	en.	Total		Mary Nutrients	Potagi

Fertilizers:	Tons of	tilizers Applied		
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	14810	2395	2322	2540

Lime: Limestone equivalent purchased or applied, tons:
Table 8 29198

Salts: Applied on all highways, tons: Table 9 6572

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AR	EA: Lake Mic	nigan 2.0	_ STATE:_	Michigan
PLANNING SU	BAREA: Southeas	t 2.3	_ COUNTY:_	Clinton

TABLE 1 PSTIMATED AMOUNTS OF CHEMICALS HISED ON CROPS, 1972

	Herbi	cides	Insect	cicides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	56970	1566.6	12660	189.9		
Grains	18/120	92.1	6140	61.4		
Hay or Grass Silage	3/100	94.0	7834	78.3		
Pastured Cropland	57,38	51.3	51,38	51.3		
Other Field Crops	31378	690.6	2034	112.6	204	30.6
Vegetables	615	34.0	472	36.0	390	38.9
Orchards						
Berries						
Nursery, Greenhouse						-88
Other Crops						
Totals	122221	2531.6	34578	461.5	594	69.5
Total Herbicides, In	nsecticide	es. Fungi	cides: 10	00 1bs	157393	3062,6

TABLE 2-MANURE	FROM	SWINE
----------------	------	-------

30 Total
6391
4529
5500
3

TARLE 3 ... MANUEL PROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	148588	17910	30678			
1969	43556	16156	27400			
1972	1,7600	17600	30000			
Wet Manure Factor: Tons Per Animal		13.14	6.45			
Wet Manure Tons, 197		231264	193500			
	Defecated: Tons, 1972					
autrients 1	n Wet Manure: Nitrog	orus, tons 125				
		tons 212h				

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item		Sheep & Lambs	Horses & Ponies
1964		13860	
1969		9865	1068
1972		8000	3132
Wet Manure Factor: Tons per	animal	1.61	12.78
Wet Manure Defecated: Tons,		12880	1,0027
Nutrients in Wet Manure: Ni		180	276
	osphorus, Tons	27	40
Pc	tash, Tons	129	240

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	118305		
1969	69181		
1972	75200		
Wet Manure Factor: Lbs. per bird	82.9		
wet Manure Defecated: Tons, 1972	3117		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	49		
Phosphorus, tons	12	A STATE OF THE PARTY OF THE PAR	
Potash, tons	13.		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 366016	Number I-V farms 1128
Number of farms	1981	Acres in I-V farms 223878
Acres in farms	286958	Cropland I-V farms 181096
Cropland in farms	225794	Harvested cropland
Harvested cropland in fa	rms 116025	I-V farms 128131

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	1,51,87	6398	1050	71118
GRAINS	25216	2968	145	307.3
Wheat	11/811	1910	28	1938
Oats	9217	952 55	13	965
Barley			0	55
Rye	606	39	14	43
OTHER FIELD CROPS	30544	3172	125	3297
Soybeans	17018	1303	35	1338
Potatoes	50/1	67	0	67
Sugar beets	O Commence			
Field beans	831	2	0	2
HAY OR GRASS SILAGE	26641	807	27	834
PASTURED CROPLAND	17195	222	2	224
Cropland used for pasture	15357	181	2	183
Improved pasture	1838	41	0	1/1
VEGETABLES, SWEET CORN, MELONS	599 14814	171	3	174
ORCHARDS	1,84	42	0	112
BERRIES	7	0	0	0
NURSERY & GREENHOUSE PRODUCTS	310	88	0	88
OTHER CROPS	150	10	0	10
Total Fertilizer Used, Tons		13880	1252	15132
Percent of Fertilizer Used		92	8	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	20337	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	3874	1972	1,331	3550	7881
Total	2/1277		rs		
Primary Nutrients in Fertilizer	11863	100	aragos socional	er Recent Yea	-
Nitrogen	3915				
Phosphorus	3796				
Potash	4152				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1205	15.1
1971-72	2473	31.1
1072-73	2551	26.5
Total Estima	ted Tons Applied on All H	lighways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	s In	secticides	Fungicides	Total	
Table 1	The second secon		51.5	69.5	3062.6	
Manure: Ki	nd of	Ton	s of Materials	in Wet Manure D	efecated	
Livestoc		Manur	e Nitrogen	Phosphorus	Potash	
Swine: Tab		39765	620	159	139	
Cattle: Ta		121764	2379	425	21.21	
Sheep: Table 4 Horses: Table 4		12880	180	27	129	
		10027	276	10	5/10	
Chickens:		3117	119	12	11	
Turkeys: T		0	0	0	0	
Total from Ton	Livestock,	520553	3504	663	2643	
Fertilizers	1	Tons of	Commercial Fe	rtilizers Applie	d	
1010444			Prin	ary Nutrients		
Ite	m	Total	Nitrogen	Phosphorus	Potasi	
Applied on Table 7		21,211	3915	3796	4152	

Lime: Limestone equivalent purchased or applied, tons: Table 8 7881

Salts: Applied on all highways, tons: Table 9 3701

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds

PLANNING AREA:	Lake Michigan 2.0	STATE:	Michigan	
PLANNING SURAREA.	Southaget 2 3	COUNTY:	Eaton	

TABLE 1 -- PSTIMATED AMOUNTS OF CHEMICALS USED ON CROPS 1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	58320	1603.8	12960	194.4		
Grains	16056	80.2	5352	53.5		
Hay or Grass Silage	7183	71.8	5986	59.8		
Pastured Cropland	51451	54.5	5451	54.5		
Other Field Crops	20104	481,4	1719	84.7	all	96.6
Vegetables	1583	105.0	1041	56.0	1117	87.5
Orchards						
Berries		-				
Nursery, Greenhouse						
Other Crops				-		
Totals	108697	2396.7	32509	502.9	1761	184.1
Total Herbicides, In	secticide	s, Fungio	ides: 10	00 lbs	112967	3083.7

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
rear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	19322	1761	1694	3455
1969	13655	1238	1155	2393
1972	1/100	1600	1300	2900

2712	Lagaroto I	2000	200.	4700
Wet Manure	Factor: Tons	per litter farrowed	7.23	
Wet Manure	Defecated: Ton	s, 1972	20967	
Nutrients i	n Wet Manure:	Nitrogen, tons	105	
		Phosphorus, tons	29	
		Potash, tons	80	

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	39448	15815	23633		
1969	31013	111,39	19574		
1972	33900	12400	21500		
Wet Manure   Per Anima	Factor: Tons	13.14	6.45		
Wet Manure 1		162936	138675		
Wet Manure	Defecated: Tons, 1972 n Wet Manure: Nitroge	Combined: 301611 m, tons 1689 orus, tons 302			

### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	12162	
1969	109/12	1519
1972	8900	5398
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	14329	68986
Nutrients in Wet Manure: Nitrogen, Tons	201	1476
Phosphorus, Tons	30	69
Potash, Tons	143	hill

# TABLE 5--MANURE FROM CHICKENS & THOUSE

Year Item	Chickens	Turkey	Turkeys Raised
1964	159215		
1969	67518		
1972	50700		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	2102		
Nutrients in Wet Manure: Nitrogen, tons	33	Combined	
Phosphorus, tons	8		
Potash, tons	7		-

TABLE 6-CROP ACREACES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	(1) 36550L	Number I-V farms 888
Number of farms	1782	Acres in I-V farms 192193
Acres in farms	259883	Cropland I-V farms 1/18085
Cropland in farms	192974	Harvested cropland
Harvested cropland in f	arms 109263	I-V farms 92813

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	33974	4543	840	5383
GRAINS	20892	2488	30	2518
Wheat	13402	1739	211	1763
Oats	6418	658	5	660
Barley	467	57	0	57
Rye	452	26	1	30
OTHER FIELD CROPS	16006	1827	97	1924
Soybeans	2347	295	3	298
Potatoes	6lili	307	0	307
Sugar beets				
Field beans	1249	33	0	33
HAY OR GRASS SILAGE	19154	337	1	338
PASTURED CROPLAND	19298	176	26	202
Cropland used for pasture	16715	153	26	179
Improved pasture	2583	23	0	23
VEGETABLES, SWEET CORN, MELONS	1778	377	12	1179
ORCHARDS	65	5	0	5
BERRIES	79	2	0	2
NURSERY & GREENHOUSE PRODUCTS	556	205	0	205
OTHER CROPS	8	1	0	1
Total Fertilizer Used, Tons		9994	1036	11030
Percent of Fertilizer Used		91	9	100

ED HOED IN 1972 TABLE S CROUND LIMESTONE ECHIVALENT

TABLE /FERTILIZER C	APPLIED				
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	14824	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	2824	1972	7392	81:0	8232
Total	17648			er Recent Yea	
Primary Nutrients in Fertilizer	8648	100	mages for our	TEL MECENE TEL	-
Nitrogen	2854	_		-	
Phosphorus	2767				
Potach	3027				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	4279	29.9
1971-72	4322	29.8
1972-73	4125	30.8

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	s Ins	secticides	Fungicides	Total
Table 1	2396.7	502	2.9	184.1	3083.7
Manure: Kind of Livestock		Tons	of Materials	in Wet Manure D	efecated
		Manure	Nitroger	Phosphorus	Potash
Swine: Tal	ble 2	20967	327	84	73
Cattle: T	able 3	301611	1689	302	1508
Sheep: Tal	ble 4	14329	201	30	3/13
Horses: T	able 4	68986	476	69	1,31,
Chickens:	Table 5	2102	33	8	7
Turkeys:	Table 5	0	0	0	0
Total from To	Livestock,	407995	2726	493	2145
Fertilizer	s:	Tons of	Commercial Fe	ertilizers Applie	đ
		100	Prin	mary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	17648	2854	2767	3027

To Convert From

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 5983

STATE: Michigan PLANNING AREA: Lake Michigan 2.0

PLANNING SUBAREA: Southeast 2.3

COUNTY: Hillsdale

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated		Acres Treated	Amount Used 100 lbs		Amount Used 100 1bs
Corn	70020	1925.5	15560	233.4		
Grains	121,20	62.1	Lillo	11.1		
Hay or Grass Silage	7976	79.7	66L7	66.lı		
Pastured Cropland	5608	56.0	5608	56.0		
Other Field Crops	27/1/10	128.8	1340	13.4		
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	77.71.61	2552.1	33205	110.6	0.20	-01

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	30907	3381	3167	651.8
1969	22006	2276	2052	1,308

Total Herbicides, Insecticides, Fungicides: 100 lbs 150759 2962.7

23096 3000 Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons 38319 192 Phosphorus, tons Potash, tons 7/16

TARTE 2 MANIEUR FROM CUTNE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	37273	16329	503/1/7		
1969	31215	13064	18151		
1972	34100	14200	19900		
et Manure Facto Per Animal	or: Tons	13.14	6.45		
et Manure Defec	cated:	186588	128355		
Tons, 1972 et Manure Defec	cated: Tons, 19 Manure: Nitro Phos	72 Combined: 314943			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	8977	
1969	7590	1763
1972	6200	5142
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	9982	65715
Nutrients in Wet Manure: Nitrogen, Tons	140	153
Phosphorus, Tons	21	66
Potash, Tons	1.00	394

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Chickens	Turkey Hens	Turkeys Raised
208315		
189700		
82.9		
123	Combined	
31		
28		-
	208315 2170h2	Chickens Hens  208315  2170h2  189700  82.9  7863  Combined

TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969 COUNTY, land area, acres (1) 38h256 Number I-V farms 1027

Acres in farms 2	78865	Cropland I-	V farms 1999 V farms 1574 ropland V farms 1060	23
Crops	Crop Acre		of Fertilize	
CORN	1458714	5685	1315	7000
GRAINS	20855	2395	75	2470
Wheat	11279	1418	Lili	1462
Oats	8683	918	30	948
Barley	89	10	0	10
Rye	343	16	0	16
OTHER FIELD CROPS	16339	747	79	826
Soybeans	16277	746	71	817
Potatoes	1	0	0	0.
Sugar beets			7	
Field beans	1110	1	0	1
HAY OR GRASS SILAGE	21905	14145	314	1479
DACTURED CROPT AND	7,600€	776	1	7.00

PASTURED CROPLAND
Cropland used for pasture Improved pasture VEGETABLES, SWEET CORN, MELONS BERRIES
NUSSERY & GREENHOUSE PRODUCTS
OTHER CROPS
Total Fertilizer Used, Tons
Percent of Fertilizer Used 10946

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

ALLE TO A STATE OF THE STATE OF		1000000	APPLIED		
Item	Tons	-	Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	14712	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	2802	1972	3857	10000	13857
	- 1 June 1	Ton	nages for Oth	er Recent Yea	rs
Primary Nutrients in Fertilizer	8582				-
Nitrogen	2832	-			
Phosphorus	2746				
Potash	3004				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	3386	30.44
1971-72	2539	23.0
1972-73	3217	27.3
Total Estimat	ted Tons Applied on All Hi	

TABLE 10 SUMMARY OF ACRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Inse	cticides	Fungicides	Total
Table 1	2552.1		410.6		2962.7
Manure: Kir	nd of	Tons	of Materials	in Wet Manure De	efecated
Livestock		Manure	Nitrogen		Potash
Swine: Tabl		38319	598	153	134
Cattle: Tal		314943	1764	315	1575
Sheep: Tabl		9982	140	21	100
Horses: Tal		65715	453	66	391
Chickens:		7863	123	31	28
Turkeys: Ta		0	0	0	0
Total from I	Livestock,	436822	3078	586	2231
Fertilizers	:	Tons of C		rtilizers Applie	1
			Prim	ary Nutrients	
Ite	n	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	17514	2832	2746	3004

Table 8

Salts: Applied on all highways, tons: Table 9 4666

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan PLANNING SUBAREA: Southeast 2.3 COUNTY: Ingham

TABLE 1 ... POTTMATER AMOUNTS OF CUPMICALS HISTORIA OR CROPS 1072

	Herbi	lcides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	59400	1633.5	13200	198.0		
Grains	9720	48.6	3240	32.4		
Hay or Grass Silage	7830	78.3	6525	65.2		
Pastured Cropland	4132	41.3	4132	41.3		
Other Field Crops	7706	166.1	528	12.8	73	10.9
Vegetables	1554	114.6	1353	149.0	1.064	94.5
Orchards				100		1000
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	903/12	2082.4	28978	498.7	1137	105.4
Total Herbicides, In				00 lbs	120157	2686 E

TABLE 2--MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Spring	June 1-Nov. 30 Fall	Total
1964	23153	2181	25/10	1,721
1969	19679	1714	1776	3/190
1972	20200	2300	2000	1,300

Nutrients in Wet Manure: Nitrogen, tons\_ Phosphorus, tons Potash, tons

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	43412	17792	25620		
1969	37142	14199	22943		
1972	40600	15400	25200		
Wet Manure Fa Per Animal	actor: Tons	13.14	6,45		
Wet Manure De Tons, 1972	efecated:	202356	162540		

Year Item	Sheep & Lambs	Horses & Ponies
1964	12246	
1969	11135	1394
1972	9100	5028
Wet Manure Pactor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	14651	64258
Nutrients in Wet Manure: Nitrogen, Tons	205	1443
Phosphorus, Tons	31	Q <sub>1</sub>
Potash, Tons	147	386

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year It		hickens	Turkey Hens	Turkeys Raised
1964	8	1267		
1969		786		
1972	6	7500		
Wet Manure Factor: Lbs.	per bird 8	.9		
Wet Manure Defecated: Tor		798		
Nutrients in Wet Manure: Nitrogen	tons 1		Combined	
Phosphori Potash, t				-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(I) 357696	Number I-V farms 720
Number of farms	1399	Acres in I-V farms 163126
Acres in farms	230949	Cropland I-V farms 197119
Cropland in farms	162734	Harvested cropland
Harvested cropland in far	rms 101153	I-V farms 88065

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	41260	6220	1.650	7870
GRAINS	16713	1936	60	1996
Wheat	9291	1128	1,8	1176
Oats	6126	700	77	711
Barley	200	28	0	28 73
Rye	1045	73 822		73
OTHER FIELD CROPS	71146		38	860
Soybeans	4196	407	8	415
Potatoes	73	143	0	43
Sugar beets				
Field beans	321	0	0	0
HAY OR GRASS SILAGE	21068	708	34	742
PASTURED CROPLAND	12221	215	0	215
Cropland used for pasture	11156	182	0	182
Improved pasture	1065	33	0	33
VEGETABLES, SWEET CORN, MELONS	1526	1475	27	502
ORCHARDS	350	69	0	69
BERRIES	8	2	0	2
NURSERY & GREENHOUSE PRODUCTS	640	214	0	5371
OTHER CROPS	42	2	0	2
Total Fertilizer Used, Tons		10663	1809	12472
Percent of Fertilizer Used		85	15	100

TABLE / FERTILIZER C	1917 TN 1917	LABLE	APPLIED	PESIONE EQUIV	ALIGNA	
Item	Tons		Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	16762	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	3193	1972	1598	4500	9098	
Total	19955	Tonnages for Other Recent Years				
Primary Nutrients in Fertilizer	9778	100	nages for our	er Recent rea	-	
Nitrogen	3227				_	
Phosphorus	3129					
Potash	3422					

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	4279	29.9
1971-72	4322	29.8
1972-73	5499	30.8
	ited Tons Applied on All	Highways in 1972-73,

	Herbicides			Fungicides	Total
Table 1	2082.4	498.7		105.4	2686.5
Manure: Ki	ind of	Tons	of Materials	in Wet Manure D	efecated
Livesto	ck	Manure		Phosphorus	Potash
Swine: Tab	le 2	31.089	1485	124	109
Cattle: Ta	able 3	364896	2043	365	1824
Sheep: Tab	ole 4	14651 205		31.	147
Horses: Ta	able 4	64258	14143	64	380
Chickens:	Table 5	2798	14/4	11	10
Turkeys: 7	Table 5	0	0	0	0
Total from Livestock, Tons		477692	3220	595	2470
Fertilizers	51	Tons of		rtilizers Applie	d
				ary Nutrients	
Ite	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	19955	3227	3129	31422

To Convert From Pounds (1b)

To Kilograms (kg) Hectare (ha) Kilograma (kg) Acres (acre) Tons (ton)

Multiply By 0.453 907.2

Salts: Applied on all highways, tons: Table 9 7976

PLANNING AREA: Lake Michigan 2,0 STATE: Michigan PLANNING SUBAREA: Southeast 2.3 COUNTY: Ionia

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	56880	1564.2	12640	189.6		
Grains	18582	92.9	6194	61.9		
Hay or Grass Silage	1,0004	100.0	8336	83.3		
Pastured Cropland	5918	59.1	5918	59.1		
Other Field Crops	14705	349.5	1050	36.7	250	37.5
Vegetables	1029	70.3	712	37.5	958	72.4
Orchards		-	-		Maria	
Berries	1841	89.3	2125	224.9	2127	564.5
Nursery, Greenhouse						
Other Crops						
Totals	108959	2325.3	36975	693.0	3335	674.4
Total Herbicides, In				00 1bs	149269	3692.7

TABLE	2	MANUR	E FROM	SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	26295	2829	2194	5023
1969	263114	2172	2264	14436
1972	27100	2800	2500	5300

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 3831
Nutrients in Wet Manure: Nitrogen, tons 192 38319 Phosphorus, tons Potash, tons

----

Cows & Heifers Calved 19863 18186	Heifers, Steers, Bulls, Calves
18186	
19800	311.00
13.14	6.45
260172	200595
	CANADA I

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item		Sheep & Lambs	Horses & Ponies
1964		10174	
1969		7634	1132
1972		6200	31:31:
Wet Manure Factor: Tons per anim	al	1.61	12.78
Wet Manure Defecated: Tons, 1972		9982	43887
Nutrients in Wet Manure: Nitroge		140	303
	rus, Tons	21	lili
Potash.	Tons	100	263

TARLE S .- MANIED FROM CUTCVENC & THEFTE

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964 1969 1972	98820 114593 99200		
Wet Manure Factor: Lbs. per bird Wet Manure Defecated: Tons, 1972	82.9 1112		
Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons	64 16 14	Combined	-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969 COUNTY, land area, acres (1) 367808 Number I-V farms 1060

Number of farms         1629           Acres in farms         2801           Cropland in farms         2115           Harvested cropland in farms         1389	2h 19	Acres in I-V farms 230970 Cropland I-V farms 179887 Harvested cropland I-V farms 126651			
	Crop	Tons o	r Used		
Crops	Acre		Liquid	Tota	
CORN	49044	5889	1321	7210	
GRAINS	28624	3052	1321 56	3108	
Wheat	15592	1764	39	1803	
Oats	11628	1165	17	1182	
Barley	495	56 36	0	56 36	
Rye	601	36	0	36	
OTHER FIELD CROPS	13790	1139	77	1216	
Soybeans	3286	231	19	250	
Potatoes	249	100	0	100	
Sugar beets					
Field beans	1964	14	0	4 %	
HAY OR GRASS SILAGE	29733	886	8	894	
PASTURED CROPLAND	21403	186	4	190	
Cropland used for pasture	18467	152	14	156	
Improved pasture	2936	34	0	34	
VEGETABLES, SWEET CORN, MELONS	1973	359	3	362	
ORCHARDS	2489	1/11	23	164	
BERRIES	12	0	0	0	
NURSERY & GREENHOUSE PRODUCTS	203	43	0	43	
OTHER CROPS	200	0	0	0	
Total Fertilizer Used, Tons		11699	1/192	13191	
Percent of Fertilizer Used		89	11	100	

TABLE 7--FEE

Fertilizer

on Crops: Total Primary Nut Fertilizer Nitrogen Phosphorus Potash

7-FERTILIZER U	SED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
izer Used	17729	Year	Government	Government Cost/Shared	Total Tonnage
Liquid	3377 21106	1972	6733	1000	7733
y Nutrients in	21100	Ton	mages for Oth	er Recent Yea	rs
lizer	3377	-			-
gen	1111/4				
Control Control	3070				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	4676	27.3
1971-72	5479	32.1
1972-73	5649	31.0
Total Estima	ited Tons Applied on All Hi ed 8193	ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Tn	secticides	Fungicides	Total
Table 1	2325.3		693.0	674.4	3692.7
Manure: Kin	nd of	Ton	s of Materials	in Wet Manure D	efecated
Livestock		Manur	e Nitrogen	Phosphorus	Potash
Swine: Tab		38319	598	153	134
Cattle: Tal		160767	2580	461	2304
Sheep: Tab		9982	140	21	100
Horses: Tal		1,3887	303	144	263
Chickens:		1,112	64	16	14
Turkeys: Ta		0	0	0	0
Total from I	Livestock,	557067	3685	695	2815
Fertilizers	:	Tons of	Commercial Fer	rtilizers Applie	d
			Prim	ary Nutrients	.,
Ites	n	Total	Nitrogen	Phosphorus	Potasi
Applied on (	Cropland:	21106	1114	1068	1182

Table 8 7733

Salts: Applied on all highways, tons: Table 9 8193

Multiply By To. 0.453 Kilograms (kg) Hectare (ha) Kilograms (kg)

907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan PLANNING SUBAREA: Southeast 2.3 COUNTY: Jackson

TARLE 1 POSTMATER AMOUNTS OF CUPATOAYS HERR ON CRORS 1072

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	55080	1514.7	12240	183.6		
Grains	8256	41.2	2752	27.5		
Hay or Grass Silage	10378	103.7	8648	86.4		
Pastured Cropland	6404	64.0	6404	64.0		
Other Field Crops	1349	27.9	3710	7.6	60	9.0
Vegetables	772	59.0	734	84.3	627	40.0
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	82230	1810.5	30978	),53 ),	687	49.0
Totals Total Herbicides, In	82239 secticide	1810.5 s, Fungio		453.4 00 1bs	687 1138lds	

#### TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Sou	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	17160	1653	1834	31.87
1969	15283	1330	1605	2935
1972	15700	1700	1800	3500

Wet Manure Factor: Tons per litter farrows
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

#### TABLE 3-MANURE FROM CATTLE

93 0		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	34563	14650	19913			
1969	40794	15292	25502			
1972	44600	16600	28000			
Wet Manure F Per Animal	actor: Tons	13.1h	6.15			
Wet Manure D Tons, 1972		218124	180600			
	efecated: Tons, 1972 Wet Manure: Nitrog		4			
mutitents in						
		orus, tons 399 , tons 1994				

### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	18491	
1969	17327	1616
1972	11:100	61112
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	22701	82329
Nutrients in Wet Manure: Nitrogen, Tons	31.8	568
Phosphorus, Tons	48	82
Potash, Tons	227	1194

## TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys
1964	100h25		
1969	6LOL8		
1972	66700		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	2765		
Nutrients in Wet Manure: Nitrogen, tons	143	Combined	
Phosphorus, tons	11		
Potash, tons	10		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	1168h8	Number I-V farms 736
Number of farms	1577	Acres in I-V farms 180755
Acres in farms	258094	Cropland I-V farms 128710
Cropland in farms	175259	Harvested cropland
Harvested cropland in	farms 100751	I-V farms 85507

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	37028	143143	1664	6007
GRAINS	16946	1627	79	1706
Wheat	7876	860	2:2:	904
Oats	8129	681	28	709
Barley	205	28	2	30
Rye	41.6	31	0	37
OTHER FIELD CROPS	1623	200	3	203
Soybeans	998	75	1	76
Potatoes	60	30	.0	30
Sugar beets				
Field beans	1074	2	0	2
HAY OR GRASS SILAGE	27179	533	12	545
PASTURED CROPLAND	19828	565	0	565
Cropland used for pasture	16472	156	0	156
Improved pasture	3356	409	0	109
VEGETABLES, SWEET CORN, MELONS	808	367	1	368
ORCHARDS	1016	75	26	1.01
BERRIES	37	8	0	8
NURSERY & GREENHOUSE PRODUCTS	404	107	0	107
OTHER CROPS	160	2	0	2
Total Fertilizer Used, Tons		7829	1785	9614
Percant of Fertilizer Used		81	19	100

TABLE 7FERTILIZER	USED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	12921	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	2461 15382	1972	4388	2850	7238
Primary Nutrients in Fertilizer	7537	Ton	nages for Oth	er Recent Yea	rs -
Nitrogen Phosphorus	2487 2412			Life I	
Detroile	2638				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	8155	32.0 26.9
1971-72	6816	26.9
1972-73	7593	28.0

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides 1810.5		cticides	Fungicides	Total
Table 1	TOTO+2	453	.4	49.0	2312.9
Manure: Ki	nd of	Tons	of Materials	in Wet Manure D	efecated
Livestoc	k	Manure	Nitrogen	Phosphorus	Potash
Swine: Tab	1e 2	25305	395	101	89
Cattle: Ta	ble 3	398721	2233	399	1994
Sheep: Tab	le 4	22701	318	48	227
Horses: Ta	ble 4	82329	568	82	494
Chickens:	Table 5	2765	43	11	10
Turkeys: T	able 5	0	0	0	0
Total from Ton		531824	3557	Q <sub>i</sub> 1	2814
Fertilizers	:	Tons of C	ommercial Fer	tilizers Applie	d
			Prima	ry Nutrients	
Ite	m.	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	15382	2h87	2412	2638

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 ,4047 907.2

Salts: Applied on all highways, tons: Table 9 11013

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan \_\_ COUNTY: Kalamazoo PLANNING SUBAREA: Southeast 2.3

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	45000	1237.5	10000	150.0		
Grains	12630	63.1	4210	42.1		
Hay or Grass Silage	4651	46.5	3876	38.7		
Pastured Cropland	3029	30.2	3029	30.2		
Other Field Crops	5514	111.0	423	12.9	83	12.4
Vegetables	102	4.0	92	2.8	51	2.6
Orchards						
Berries	858	41.1	1001	103.1	1001	254.0
Nursery, Greenhouse						The state of
Other Crops						
Wasterland and the state of the	pr a01	arion I	00/22	220 9	1135	0/0.0
Totals Total Herbicides, In	71.784	1533.4	22631	379.8	95550	269.0

THREE Z-PHANURE FROM SHIR	TABLE	2MANURE	FROM	SWINE
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	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total_
1964	21673	1879	2022	3901
1969	23380	1633	1856	3489
1972	211200	2100	21.00	4200
Wet Manu	re Defecated:	ons per litter f. Tons, 1972 re: Nitrogen, t. Phosphorus, Potash, ton	30366 ons 152	

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	21030	6276	11:751		
1969	20219	6150	11,069		
1972	22100	6700	15400		
Wet Manure H Per Animal		13.14	6.45		
Wet Manure I Tons, 1972		88038	99330		
	Defecated: Tons, 197		68		
		phorus, tons 187			
	Pota	sh, tons 937			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item		Sheep & Lambs	Horses & Ponies
1964		5993	
1969		2701	1227
1972		2200	5047
Wet Manure Factor: Tons per ani	mal	1.61	12.78
Wet Manure Defecated: Tons, 1977		3542	64501
Nutrients in Wet Manure: Nitrog		50	1415
Phosphe	orus, Tons	7	65
Potash	Tons	35	387

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		103305		
1969		192988	,	
1972		137300		
Wet Manure Fact	or: Lbs. per bird	82.9		
Wet Manure Defe	cated: Tons, 1972	5691		
Nutrients in We	t Manure: Nitrogen, tons	88	Combined	
	Phosphorus, tons	23		
	Potash, tons	20		10

COUNTY, land area, acr	ces 359488	Number I-V farms 621
Number of farms	11.94	Acres in I-V farms 138851
Acres in farms	185274	Cropland I-V farms 108692
Cropland in farms	139793	Harvested cropland
Harvested cropland in	farms 82822	I-V farms 70752

	Crop	Tons o	f Fertilize	T Used
Crops	Acres	Dry	Liquid	Tota
CORN	29267	3292	907	41.99
GRAINS	20730	1758	413	2171
Wheat	11049	1147	2111	1391
Oats	7753	469	124	593
Barley	903	59 50	36	95
Rye	620	50	0	50
OTHER FIELD CROPS	Shoh	245	98	343
Soybeans	5239	206	98	304
Potatoes	83	30	0	30
Sugar beets				
Field beans	1000	0	0	0
HAY OR GRASS SILAGE	12102	391	В	399
PASTURED CROPLAND	9128	61	2	63
Cropland used for pasture	8115	149	2	51
Improved pasture	1013	12	0	12
VEGETABLES, SWEET CORN, MELONS	195	90	1	91
ORCHARDS	1873	325	12	337
BERRIES	1:14	18	0	18
NURSERY & GREENHOUSE PRODUCTS	357	72	9	81
OTHER CROPS	95	13	0	13
Total Fertilizer Used, Tons		6265	1450	7715
Percent of Fertilizer Used		81	19	100

SED IN 1972	TABLE		MESTONE EQUIV	ALENT
Tons			Tonnage not	
10369	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
	1972	9011	31428	12469
TS 200	Ton	nages for Oth	er Recent Yes	TS
6049				-
1996		-		
1936				
2117				
	10369 1975 12344 6049 1996 1936	Tons  10369 1975 123hli 1996 1936	Tons Tonnage Covernment Year Cost/Shared 1975 123hlt Tonnages for 0th 60h9 1926 1936	Tons

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	6113	30.3
1971-72	5734	28.9
1072-72	6843	32.0
Total Estima As Comput	ted Tons Applied on All I	Highways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides		ecticides	Fungicides	Total 2182.2
Table 1	1533.4	379.8		269.0	
Manure: Kind of		Tons	of Material	s in Wet Manure	
Livesto	ck	Manure	Nitroge	n Phosphorus	Potash
Swine: Tab	ole 2	30366	474	121	106
Cattle: Ta		187368	10/19	187	937
Sheep: Table 4		35/12	50	7	35
Horses: Ta		61501	1115	65	387
Chickens:		5691	88	23	20
Turkeys:		0	0	0	0
	Livestock,	2911/68	2106	1403	1485
Fertilizer	s:	Tons of		ertilizers Appli	ed
			Pri	mary Nutrients	-
Ite	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	12344	1996	1936	2117

Salts: Applied on all highways, tons: Table 9 9925

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan
PLANNING SUBAREA: Southeast 2.3 COUNTY: Kent

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	34110	938.0	7580	113.7	100	
Grains	8040	40.2	2680	26.8		
Hay or Grass Silage	10501	105.0	8751	87.5		
Pastured Cropland	6406	64.0	6406	64.0		
Other Field Crops	1750	45.2	570	58.2	500	75.0
Vegetables	1059	41.7	866	66.7	892	47.1
Orchards						
Berries	10150	489.5	12124	1255.9	12130	3090.6
Nursery, Greenhouse						
Other Crops						
Totals	72016	1723.6	38977	1672.8	13522	3212.7
Total Herbicides, In					124515	6609.1

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	9912	861	845	1706
1969	13260	997	11.30	2127
1972	13700	1300	1200	2500

 Wet Manure Factor:
 Tons per litter farrowed
 7.23

 Wet Manure Defecated:
 Tons, 1972
 18075

 Nutrients in Wet Manure:
 Nitrogen, tons
 90

 Phosphorus, tons
 25

 Potash, tons
 69

TABLE 3-MANURE FROM CATTLE

		Number Cattl	e and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	liohlia	17642	22807
1969 1972	39067 142700	1663l <sub>4</sub> 18100	22l <sub>4</sub> 33 2l <sub>4</sub> 600
Wet Manure I Per Animal	factor: Tons	13.14	6,45
Wet Manure I Tons, 1972		237834	158670
	Defecated: Tons, 19	rogen, tons 222	0
		sphorus, tons 397 ash, tons 198	

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2933	
1969	1974	1465
1972	1600	1465 3456
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2576	44168
Nutrients in Wet Manure: Nitrogen, Tons	36	305
Phosphorus, Tons	5	144
Potash, Tons	26	265

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	177245		
1969	183857		
1972	114500		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	1,71,6		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	74		
Phosphorus, tons	19		
Potash, tons	17		4

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 548514	Number I-V farms	1080
Number of farms	1897	Acres in I-V farms	179605
Acres in farms	21,1101	Cropland I-V farms	138598
Cropland in farms	177595	Harvested cropland	
Harvested cropland in fa	erms 111295	I-V farms	98628

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	34281	4221	1112	5333
GRAINS	15043	1487	12	1499
Wheat	5795	626	6	632
Oats	7063	668	6	
Barley	271	20	0	20
Rye	1,00	22	0	55
OTHER FIELD CROPS	2540	528	25	553
Soybeans	120	7	0	7
Potatoes	502	316	17	333
Sugar beets				
Field beans	1075	5	0	5
HAY OR GRASS SILAGE	28813	600	14	604
PASTURED CROPLAND	18860	202	0	202
Cropland used for pasture	17651	183	0	183
Improved pasture	1209	19	0	19
VEGETABLES, SWEET CORN, MELONS	2059	857	12	869
ORCHARDS	15356	1379	128	1507
BERRIES	111	7	0	7
NURSERY & GREENHOUSE PRODUCTS	111	58	1	59
OTHER CROPS	11/1	7	0	7
Total Fertilizer Used, Tons		9351	1294	10645
Percent of Fertilizer Used	A TOTAL PROPERTY.	88	12	100

ABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

TABLE /FERTILIZER L	LADLE	APPLIED	MESIONE EQUIV	ALLIANTA	
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	11,307	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	2725	1972	6lili7	7200	13647
Total	17032			er Recent Yes	
Primary Nutrients in Fertilizer	8346	101	mages ros oco	1000000	-
Nitrogen	2754				
Phosphorus	2670				
Potash	2922				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	23622	51.3
1971-72	25287	55.3
1972-73	19204	39.0
Total Est As Com	imated Tons Applied on All Hi puted 27853	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	In	secticides	Fungicides	Total
Table 1	1723.6	16	72.8	3212.7	6609.1
Manure: Kin	d of	Tons	s of Material	s in Wet Manure I	efecated
Livestock		Manure	Nitroge	n Phosphorus	
Swine: Tabl	e 2	18075	282	72	63
Cattle: Tab	le 3	396504	2220	397	1983
Sheep: Tabl	e 4	2576	36	5	26
Horses: Tab	1e 4	1/11/68	305	1/14	265
Chickens: 1	able 5	L746	77	19	17
Turkeys: Ts	ble 5	0	0	0	0
Total from L Tons		1,66069	2920	537	2354
Fertilizers:		Tons of	Commercial F	ertilizers Applie	d
			Pri	mary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potas
Applied on C	ropland:	17032	2754	2670	2922

Lime: Limestone equivalent purchased or applied, tons: Table 8 13647

Salts: Applied on all highways, tons: Table 9 27853

To Convert From
Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

\_\_ STATE: \_\_ Michigan PLANNING AREA: Lake Michigan 2.0 PLANNING SUBAREA: Southeast 2.3 COUNTY: Montcalm

ALS USED ON CROPS, 1972 TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972	

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	37350	1027.1	8300	124.5		
Grains	16812	84.0	5604	56.0		
Hay or Grass Silage	7935	79.3	6612	66.1		
Pastured Cropland	1/1/17	14.1	14:11	111.1		
Other Field Crops	31320	817.5	10330	1058.8	9100	1365.0
Vegetables	71110					
Orchards						
Berries	767	36.8	893	93.9	893	241.8
Nursery, Greenhouse						
Other Crops						
Totals	98595	2088.8	36150	1443.4	9993	1606.8
Total Herbicides, In				0 1bs	11/1/738	5139.0

#### TABLE 2--MANURE FROM SWINE

Hog & Pig	Number Sos	s Farrowing	
Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
8814	760	734	1494
6780	518	572	1090
7000	700	600	1300
	881h 6780 7000	Dec. 1         Spring           881h         760           6780         518           7000         700	Dec. 1         Spring         Fall           881h         760         73h           6780         518         572

# TABLE 3-MANUER PROM CATTLE

		Number Cattle and Calves					
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	31,01,0	14895	1911/5				
1969	21,508	11081	13127				
1972	26800	1.2000	11,800				
Wet Manure Per Anima	Factor: Tons	13.14	6.45				
Wet Manure Defecated: Tons, 1972		157680	95460				
	Defecated: Tons, 197	gen, tons 1/18					
		horus, tons 253 h, tons 1266					

## TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	3905	
1969	1796	755
1972	1/100	2766
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2254	35349
Nutrients in Wet Manure: Nitrogen, Tons	32	244
Phosphorus, Tons	5	35
Potash, Tons	23	212

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	109215		
1969	26864		
1972	28800		
Wet Manure Factor: Lbs. per bird	82.9		
wet Manure Defecated: Tons, 1972	1194		
Nutrients in Wet Manure: Nitrogen, tons	19	Combined	
Phosphorus, tons	5		
Potash, tons	li .		-

COUNTY, land area, acres_	155936	Number I-V farms 856
Number of farms	1715	Acres in I-V farms 195967
Acres in farms	269494	Cropland I-V farms 115719
Cropland in farms	191005	Harvested cropland
Harvested cropland in far	ms 120699	I-V farms 103166

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	24883	3340	436	3776
GRAINS	21226	1981	10	2022
Wheat	8127	891	30 6	921
Oats	9332			892
Barley	7/48	114	0	14
Rye	3430	180	3	185
OTHER FIELD CROPS	31579	6942	943	7885 89
Soybeans	840	85	4	89
Potatoes	9088	14459	874	5333
Sugar beets			1	
Field beans	31455	1.8	0	18
HAY OR GRASS SILAGE	20832	321	1	322
PASTURED CROPLAND	13594	101	0	101
Cropland used for pasture	12788	101	0	101
Improved pasture	806	0	0	0
VEGETABLES, SWEET CORN, MELONS	896	183	6	189
ORCHARDS	1003	89	1	90
BERRIES	214	14.	1	
NURSERY & GREENHOUSE PRODUCTS	57	10	0	10
OTHER CROPS	109	3	0	3
Total Fertilizer Used, Tons		12992	1429	11/1/21
Percent of Fertilizer Used		90	10	100

TABLE 7FERTILIZER	USED IN 1973	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	19381	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	3692	1972	8315	20800	29115
Total	23073			er Recent Yea	rs
Primary Nutrients in Fertilizer	11306	101	mages for our	The center Add	-
Nitrogen	3731				-
Phosphorus	3618				
Potash	3957				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per
1970-71	2211	17.0
1971-72	2194	17.0
1972-73	2333	15.8
Total Estim	ated Tons Applied on All Hi	ighways in 1972-73,

## TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides 2088.8		secticides	Fungicides 1606.8	Total 5139.0
	ind of	Ton	s of Material	ls in Wet Manure	Defecated
Manure: K		Manur			Potasi
Swine: Tal		9399	147	38	33
Cattle: Table 3		253140	1418	253	1266
Sheep: Table 4		2254	32	5	23
Horses: Table 4		35349	32 21:11	35	212
Chickens: Table 5		1194	19	5	4
Turkeys:		0			
Total from Livestock, Tons		301338	1860	336	1538
Fertilizer	8:	Tons of	Commercial	Fertilizers Appli	ed
			Pri	imary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potasi
Applied on Cropland: Table 7		23073	3731	3618	3957

Salts: Applied on all highways, tons: Table 9 3384

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manur	s, Fertilizers,	Lime and High	hway De-Icing Compounds
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PLANNING AREA:	Lake Michigan 2.0	STATE:	Michigan
PLANNING SUBAREA:	Southeast 2.3	COUNTY:	Ottawa

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMICALS	HISED	ON	CROPS	1972
- A R NO ASSET	THE RESIDENCE	<b>東京大学の大学をか</b>	WA.	CHERTICAL DEPART	O'M' ALLES	(MAS)	WANTED DO	Acres 6.40

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	33840	930.6	7520	112.8		
Grains	6510	32.5	2170	21.7		
Hay or Grass Silage	771.8	77.1	61157	64.5		
Pastured Cropland	4678	16.7	1678	46.7		
Other Field Crops	350	9.7	305	34.5	300	45.0
Vegetables	1906	136.9	1563	102.3	11:22	97.9
Orchards						
Berries	3208	154.3	3884	391.5	3902	930.6
Nursery, Greenhouse						
Other Crops						
Totals	5821.0	1388.1	26577	7714.0	562L	1073.5
Total Herbicides, In	eecticide	e Functo		0.11-	90111	3235.6

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So			
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	11265	1564	1423	2987	
1969	18959	2069	2163	4232	
1972	19500	2700	2400	5100	

Phosphorus, tons Potash, tons

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves	
1964	33708	15635	18073	
1969	31793	14045	17748	
1972	34800	15300	19500	
Wet Manure 1 Per Animal	Pactor: Tons	13.14	6.45	
Wet Manure Defecated: Tons, 1972		201.01/2	125775	
	Defecated: Tons, 1972 Wet Manure: Nitroge			
	Potash,			

# TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	753	
1969	1150	777
1972	1,000	11157
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1610	56884
Nutrients in Wet Manure: Nitrogen, Tons	23	392
Phosphorus, Tons	3	57
Potash, Tons	16	341

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		573660		
1969		770416		
1972		516800	50000	500000
Wet Manure Factor	: Lbs. per bird	82.9	365	89.63
Wet Manure Defeca	ited: Tons, 1972	21/21		07.00
	Nitrogen, tons	331	Combined 3	1533 tons
	Phosphorus, tons	86.		26
	Potash, tons	75	1	10

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	360512	Number I-V farms	1167
Number of farms	1846	Acres in I-V farms	136950
Acres in farms	176745	Cropland I-V farms	104405
Cropland in farms	131410	Harvested cropland	
Harvested cropland in farms	84954	I-V farms	74377

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	30152	3593	768	4361
GRAINS	12289	11424	13	1437
Wheat	5070	630	7	637
Oats	5275	575	3	578
Barley	245	29	0	29
Rye	198	1.8	0	1.8
OTHER FIELD CROPS	417	157	13	170
Soybeans	55	1	0	1
Potatoes	303	153	13	1,66
Sugar beets				
Field beans	363	1	0	1
HAY OR GRASS SILAGE	20643	534	0	534
PASTURED CROPLAND	15204	125	2	127
Cropland used for pasture	14211	120	2	122
Improved pasture	993	5	0	1 5
VEGETABLES, SWEET CORN, MELONS	2588	1.045	34	1079
ORCHARDS	1,565	562	31	593
BERRIES	2301	1435	0	593 435
NURSERY & GREENHOUSE PRODUCTS	1550	520	7	527
OTHER CROPS	22	3	0	3
Total Fertilizer Used, Tons		8399	868	9267
Percant of Fertilizer Used	The second	91	9	1.00

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	12455	Year	Government Cost/Shared	Government Cost/Shared	Total
Liquid	2372	1972	4892	1501	6096
Total	14827			er Recent Yea	
Primary Nutrients in		100	nages for oth	er Recent lea	LB
Fertilizer	7265				-
Nitrogen	2398				
Phosphorus	2325				
Potash	25142				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	675	3.4
1971-72	595	3.1
1972-73	924	3.9
Total Estima As Comput		1 Highways in 1972-73,

# TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	In	secticides	Fungicides	Total	
Table 1	1388.1	774.0		1073.5	3235.6	
Manure: Kind of Livestock		Tons of Materials in Wet Manure Defecated				
		Manur	e Nitroge	n Phosphorus	Potash	
Swine: Tab	le 2	36873	575	147	129	
Cattle: Tal	ble 3	326817	1830	327	1634	
Sheep: Tab.	le 4	1610	23	3	16	
Horses: Tal	ble 4	56884	392	57 86	347	
Chickens:	Table 5	27/127	334	86	75	
Turkeys: T	able 5	31533	492	126	110	
Total from Ton		475138	3646	746	2305	
Fertilizers	:	Tons of	Commercial F	ertilizers Applie	d	
			Pri	mary Nutrients		
Ite	n	Total	Nitrogen	Phosphorus	Potash	
Applied on Table 7	Cropland:	14827	2398	2325	25/12	

Lime: Limestone equivalent purchased or applied, tons: Table 8 6096

Salts: Applied on all highways, tons: Table 9 1340

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan PLANNING SUBAREA: Southeast 2.3 COUNTY: St. Joseph

	Herbi	cides	Insecticides		Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	53820	1480.0	11960	179.4		
Grains	11262	56.3	3754	37.5		
Hav or Grass Silage	5476	54.7	145614	45.6		
Pastured Cropland	1208	42.0	14208	42.0		
Other Field Crops	1119314	302.4	1340	56.9	415	62.2
Vegetables	863	51.7	1432	12.9	432	43.2
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	90563	1987.1	06050	374.3	81.7	105.4

TABLE	2MANURE	FROM	SWINE

	Hog & Pig Inventory	Dec, 1-May 31		
Year	Dec. 1	Spring	Fall	Total
1964	34700	3601	3503	7104
1969	36782	3288	3677	6965
1972	37900	4300	4100	8400

Phosphorus, tons Potash, tons

-		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	23882	8465	15417			
1969	22349	8184	14165			
1972	21,500	8900	15600			
Wet Manure Per Anima	Factor: Tons	13.14	6.45			
Wet Manure Tons, 197	THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TRANSPORT NAMED IN COLU	11.6946	100620			
	Defecated: Tons, 1972 In Wet Manure: Nitrogen		7566			
		rus, tons 21	.8			
	Potash,	tons 10	088			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	8153	
1969	9822	1055
1972	8000	3608
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	12880	46110
Nutrients in Wet Manure: Nitrogen, Tons	180	31.8
Phosphorus, Tons	27	146
Potash, Tons	129	277

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	135615		
1969	12/135		
1972	1,05700		
Wet Manure Factor: Lbs. per bire	82.9		
wet Manure Defecated: Tons, 1977	4381		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	68		
Phosphorus, tons	18		
Potash, tons	15		=

TABLE 6-COOP ACREAGES & PERTILIZER HISER-CLASS I-V CENSUS PARMS, 1969

COUNTY, land area, acres	323584	Number I-V farms	771
Number of farms	1380	Acres in I-V farms	191089
Acres in farms	237334	Cropland I-V farms	150878
Cropland in farms	182520	Harvested cropland	
Harvested cropland in far	ms 113855	I-V farms	100130

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	38780	4385	1520	5905
GRAINS	19181	2107	1119	2256
Wheat	13387	1638	135	1773
Oats	1007	336	7	343
Barley	216	33	2	35 54
Rye	982	51	3	
OTHER FIELD CROPS	23337	1537	90	1.627
Soybeans	21250	1126	1,2	1168
Potatoes	1:15	192	3	1.95
Sugar beets				-
Field beans	1182	2	0	2
HAY OR GRASS SILAGE	1611/8	323	25	3118
PASTURED CROPLAND	7/199/1	110	7	217
Cropland used for pasture	12910	94	6	100
Improved pasture	2081	16	1	17
VEGETABLES, SWEET CORN, MELONS	828	126	27	153
ORCHARDS	309	67	0	67
BERRIES	24		0	2
NURSERY & GREENHOUSE PRODUCTS	328	94	4	98
OTHER CROPS	708	14	0	14
Total Fertilizer Used, Tons		8767	1822	10589
Percent of Fertilizer Used		83	17	100

TABLE 7FERTILIZER USE	D IN 1972	TABLE	8-GROUND LI APPLIED	MESTONE EQUIV	ALENT	
Item	Tons		Tonnage	Tonnage not		l
Fertilizer Used on Crops: Solid	14231	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid 2	2711	1972	21,225	1274	25499	ı
	169/15			er Recent Yea	rs	1
Primary Nutrients in Fertilizer	3302		magae as a		-	
Nitrogen	27110				-	*
Phosphorus	2657					
Potash	2905					

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL BIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	51/72	29.4
1971-72	1829	26.2
1972-73	4531	23.0
Total Estima: As Compute	red Tons Applied on All Hi	ghways in 1972-73,

ABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Team	ecticides	Fungicides	Total
Table 1	1987.1		74.3	105.4	2466.8
Manure: Kin	d of	Tons	of Materials	in Wet Manure	Defecated
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Tabl		60732	947	243	213
Cattle: Tab		21.7566	1218	218	1088
Sheep: Tabl		12880	180	27	129
Horses: Tab		1,6110	318	146	277
Chickens: I		1,381	68	18	15
Turkeys: Ta		0			
Total from L	ivestock,	31,1669	2731	552	1722
Fertilizers:		Tons of		rtilizers Appli	ed
				ary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on C	cropland:	16942	2740	2657	2905

Lime: Limestone equivalent purchased or applied, tons:

Salts: Applied on all highways, tons: Table 9 6572

			GREAT LAK	ES BASIN MA	TERIAL USAGE INVENTORY	
A	gricultur				izers, Lime and Highway De-Icing Compounds	
	LANNING A		ake Michi cutheast		STATE: Michigan COUNTY: Shiawassee	
EMICAL	S USED ON	CROPS, 1	972		TABLE 6CROP ACREAGES & FERTILIZER USEDCLASS I-V CENSUS FARMS, 1969	1000
es	Insect	icides	Fungi	cides	COUNTY, land area, acres (1) 345408 Number I-V farms 947	
sed	Acres	Amount Used	Acres	Amount Used	Number of farms	

Cropland in farms

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	15000	1237.5	10000	150.0		
Grains	19212	96.0	6h0h	64.0		
Hay or Grass Silage	7003	70.0	5836	58.4		
Pastured Cropland		32.3	3230	32.3		
Other Field Crops	3230 48801	1057.6	3237	70.3	362	54.3
Vegetables	172	10.3	86	2.5	86	8.6
Orchards						
Berries						
Nursery, Greenhouse		4				
Other Crops						
Totals	123/18	2503.7	28793	377.5	11/18	62.9
Total Herbicides, In					152659	2944.3

TARLE	2MANURE	FROM	SWINE

TABLE 1 FOTTMATED AMOUNTS OF CHI

	Hog & Pig	Number So		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	11279	1281	1162	21413
1969	10994	932	866	1798
1972	11300	1200	900	21.00

Phosphorus, tons Potash, tons

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	32351	11,880	17471
1969	26657	11522	15135
1972	29200	12500	16700
Wet Manure I Per Animal	actor: Tons	13.14	6.45
Wet Manure I Tons, 1972		164250	107715

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	8314	
1969	6640	976
1972	5/100	31.94
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	8694	40819
Nutrients in Wet Manure: Nitrogen, Tons	122	282
Phosphorus, Tons	1.8	41
Potash, Tons	87	245

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	136175		
1969	181382		
1972	199400		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	8265		
Nutrients in Wet Manure: Nitrogen, tons	129	Combined	
Phosphorus, tons	33		
Potash, tons	29		-

Cropland in farms 206648
Harvested cropland in farms 11,1561 I-V farms 121722 Tons of Fertilizer Used
Dry Liquid Total Crop Acres Crops 29744 29304 4632 CORN 3400 GRAINS Wheat 2107

Number I-V farms 917
Acres in I-V farms 201976
Cropland I-V farms 168297
Harvested cropland

1692h 11327 197 Oats Barley 144 3935 2441 125 Rye OTHER FIELD CROPS 719 1155148 32510 362 Soybeans Potatoes
Sugar beets
Field beans
HAY OR GRASS SILAGE
PASTURED CROPLAND
Cropland used for pasture
Improved pasture
VEGETABLES, SWEET CORN, MELONS
ORCHARDS
BERRIFS Potatoes 6hh 129 20062 9804 92 9139 665 108 105 BERRIES
NURSERY & GREENHOUSE PRODUCTS
OTHER CROPS
Total Fertilizer Used, Tons
Percent of Fertilizer Used 83 122 11577

TABLE 7 -- PERTUITED USED IN 1972 TABLE 8-- CROUND LIMESTONE EQUIVALENT

TABLE / FERTILITIES C	JOED IN TALE	TADAD		THULDED EGGT.	
	***************************************	-	APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	17030	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	321/4	1972	31.75	1367	1,51,2
Total	20274			er Recent Yea	
Primary Nutrients in		101	mages for our	er wecent rec	1
Fertilizer	9934				-
Nitrogen	3278				-
Phosphorus	3179				
Potash	31,77				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2981	24.2
1971-72	3388	27.7
1972-73	31,31,	25.6
Total Estima:	ted Tons Applied on All H	ighways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide 2503.7	s Ine	377.5	Fungicides 62.9	Total 2944.1
rearrange to the same of the s	nd of	Tone		s in Wet Manure I	
Livesto		Manure	The same of the sa	The second secon	Potash
Swine: Tab		15183	237	61.	53
Cattle: Ta		271965	1523	272	1360
Sheep: Tab		8694	122	18	87
Horses: Ta		40819	282	41	2145
Chickens:		8265	129	33	29
Turkeys: 1	able 5	0			
Total from Tor		3141926	2293	425	1774
Fertilizers	11	Tons of	Commercial 1	Fertilizers Applie	d
			Pri	lmary Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	20274	3278	3179	3477

Salts: Applied on all highways, tons: Table 9 4980

To Convert From Pounds (1b)

Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

PLANNING AREA: Lake Michigan 2.0

STATE: Michigan COUNTY: Van Buren

PLANNING SUBAREA: Southeast 2.3

	TUMMATAR	OUDBREEK.	DOM DIRECT	) for
the continues and approximation for the	NAME OF THE PARTY	are collected as	SHOW	

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	30600	841.5	6800	102.0		
Grains	3780	18.9	1260	12.6		
Hay or Grass Silage		111.3	3694	36.9		
Pastured Cropland	31,28	34.2	3428	34.2		
Other Field Crops	21,29	53.2	643	61.1	521	78.1
Vegetables	8342	3/10.5	5774	286.5	5234	346.4
Orchards		1100112	College of		10-10-1	1212
Berries	15135	711.9	17919	4322.1	18696	2320.9
Nursery, Greenhouse Other Crops						
Totals Total Herbicides, In	683146	20111.2	39518	1855.4 0 1bs	2hli51 132115	2745.4

Hog & Pig		Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	214898	2150	2567	4727
1969	27332	2830	3491	6321
1972	28100	3700	3900	7600

Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons 54948 275 Phosphorus, tons Potash, tons 209

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964 1969	18995 13980	7862 5671	11133 8309		
1972	15300	6200	9100		
Wet Manure Per Anima	Factor: Tons	13.14	6,45		
Wet Manure Tons, 197		81468	58695		
			3		

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2928	
1969	31195	876
1972	1200	3569
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1932	45612
Nutrients in Wet Manure: Nitrogen, Tons	27	315
Phosphorus, Tons	4	1,6
Potash, Tons	19	274

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Chickens	Turkey Hens	Turkeys Raised
166335		
142200		
82.9		
5894		
92	Combined	
24		
21	_	4
	166335 155703 142200 82.9 5894	Chickens Hens 166335 155703 142200 82.9 5894 Combined 92 21

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	1) 385600	Number I-V farms 1125
Number of farms	1988	Acres in I-V farms 170820
Acres in farms	225229	Cropland I-V farms 127826
Cropland in farms	159425	Harvested cropland
Harvested cropland in far		I-V farms 83668

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	21,696	3878	533	1411
GRAINS	7746	665	18	683
Wheat	3725	366	10	376
Oats	2520	181	7	188
Barley	554	57	0	57
Rye	630	39	0	39
OTHER FIELD CROPS	1906	367	83	450
Soybeans	868	60	3	63
Potatoes	521	243	5	248
Sugar beets				
Field beans	71.7	71	0	71
HAY OR GRASS SILAGE	10686	253	1	254
PASTURED CROPLAND	10317	169	1	173
Cropland used for pasture	9478	2/13	4	21.7
Improved pasture	839	26	0	26
VEGETABLES, SWEET CORN, MELONS	8253	211/4	74	2188
ORCHARDS	25759	3972	31	4003
BERRIES	4045	1025	11	1036
NURSERY & GREENHOUSE PRODUCTS	469	181	20	201
OTHER CROPS	70	1	0	1
Total Fertilizer Used, Tons		12636	775	13411
Percent of Fertilizer Used		94	6	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED	APPLIED					
Item	Tons		Tonnage	Tonnage not					
Fertilizer Used on Crops: Solid	18025	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage				
Liquid	3433	1972	5567	11,976	20543				
Total	27/158		mages for Oth	er Recent Yes	rs				
Primary Nutrients in Fertilizer	10514	10.	angeo tot ou		-				
Nitrogen	3470								
Phosphorus	336L								
Potash	3680								

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	7054	29.0
1971-72	6870	28.6
1972-73	7394	29,2
Total Estima As Comput	ted Tons Applied on All H	ighways in 1972-73,

TABLE 10 -- SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	ecticides	Fungicides	Total
Table 1	2044.2	48	55.4	2745.4	9645.0
Manure: Ki	ind of	Tons	of Materials	in Wet Manure D	
Livesto		Manure	Nitrogen	Phosphorus	Potash
Swine: Tal	ole 2	5119118	857	220	192
Cattle: Ta		140163	785	140	701
Sheep: Tal	ole 4	1932	27	1 4	19
Horses: Ta		45612	315	46	274
Chickens:	Table 5	5894	92	24	21
Turkeys: 1	Table 5	0			-
	Livestock,	248549	2076	14314	1207
Fertilizers	3:	Tons of		tilizers Applie	d
				ry Nutrients	
Ite	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	21458	3470	3364	3680

Salts: Applied on all highways, tons: Table 9 10724

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

## 5.4.2.2 Animal Wastes

There were 9,679,440 metric tons (10,669,722 tons) of wet manure produced from livestock in PSA 2.3. This represents 37 percent of the total livestock manure in the Lake Michigan basin. There were 311,260 cows and heifers calved and 500,751 head of cattle in 1972. This is one of the few planning subareas where turkeys show even one percent of the livestock manure. Nearly 90 percent of the turkeys raised in Michigan are in this planning subarea. Nitrogen, phosphorus, and potash combined comprise 1.2 percent of the total manure tonnage.

Production levels of livestock are expected to remain relatively stable in the next 10 years. The manure production will continue at about present levels.

# 5.4.2.3 Commercial Fertilizers

A total of 442,524 metric tons (487,799 tons) of commercial fertilizer were applied to croplands in PSA 2.3, with primary nutrients representing 206,490 metric tons (227,609 tons), or 47 percent of the total. Nitrogen, phosphorus, and potash are almost equal in tonnage. Corn and soybean acreage in this planning subarea are expected to increase significantly while other crop production is expected to decrease slightly. Fertilizer levels therefore may increase slightly.

# 5.4.2.4 Lime

In 1972, 291,750 metric tons (321,666 tons) of lime were purchased or applied to croplands in PSA 2.3. This represents 46 percent of the total amount of lime applied in the Lake Michigan Basin. Based on present usage rates, liming rates will remain relatively unchanged. Government cost-sharing programs, if operative, will not significantly affect the rates.

# 5.4.2.5 Salts

There were 172,065 metric tons (189,667 tons) of road de-icing salts applied to all highways in PSA 2.3. This represents 29 percent of all road de-icing salts applied in the Lake Michigan basin. The amounts of road de-icing salts may increase in proportion to increases in road mileage. However, increasing salt costs will limit expanded usage.

# 5.5 Planning Subarea 2.4

Planning Subarea 2.4 contains 21 counties, all in Michigan. Total land area equals 3,288,500 hectares (8,125,696 acres). Lands in farms total 626,750 hectares (1,546,220 acres), or 19 percent of the total land area. The majority of land in this planning subarea is in forests.

### 5.5.1 Agricultural Characteristics

Agriculture is less important here than in some of the more southerly planning subareas; however, there is production of importance in the subarea. About one-half of the Great Lakes Basin fruit output is in PSA 2.4 and PSA 2.3. The major crops produced are hay or grass silage, corn, oats and fruits.

Table 5-78 indicates the relative proportions of materials usage in the planning subarea as compared to the total Great Lakes Basin.

Table 5-78

MATERIALS USAGE BASIN RELATIONSHIP -- PSA 2.4 TO GREAT LAKES

Per harvested acre of cropland	Planning Subarea 2.	4 Great Lakes Basin
Lbs of chemicals applied	4.45	2.66
Index of chemicals used	167	100
Tons of livestock manure defecated	4.42	3.37
Index of manure defecated	131	100
Lbs of primary nutrients in livestoo	ck manure 108	82
Index of primary nutrients in manure	132	100
Lbs commercial fertilizer applied	307	321
Percent liquid fertilizer applied	16	22
Index commercial fertilizer applied	96	100
Lbs primary nutrients in commercial	fertilizer 150	153
Index primary nutrients in commercial	l fertilizer 98	100
Lbs of lime applied	241	170
Index of lime used	142	100
Per acres of total land area		
Lbs road salts used	15.95	41.74
Index road salts used	38	100
To Convert From	То	Multiply By
	grams (kg)	0.454
	grams (kg)	907.2
	ic Tons	0.907

159

# 5.5.2 Materials Usage

The following table summarizes by county the materials usage inventory for PSA 2.4.

Table 5-79 MATERIALS USAGE (in 1972)

	Chemicals		Commercial	Limestone	Salts
	Applied	Livestock		Purchased	Applied to
	to Crops (100 lbs)	Manure (tons)	on Croplands (tons)	or Applied (tons)	all Highways (tons)
ichigan					
Antrim	820	83296	3466	1081	2915
Benzie	830	29452	1142	2194	2356
Charlevoix	288	87816	1293	1550	2465
Delta	337	128809	2229	91	4627
Emmet	309	90278	2022	355	2965
Grand Traverse	1957	93130	6106	1600	2270
Kalkaska	122	30336	528	1416	2428
Lake	110	43701	373	1061	1759
Leelanau	1845	63042	6114	2025	1039
Mackinac	75	49721	526	58	4635
Manistee	1952	60720	5386	2961	2240
Mason	1752	131817	5160	3109	1122
Mecosta	1979	213050	8384	5795	3032
Missaukee	586	190001	3757	5382	1692
Muskegon	1402	140527	5355	3497	6927
Newaygo	2453	254906	7839	6562	5148
Oceana	4313	148747	10466	12999	1253
Osceola	626	236477	3053	5363	3670
Roscommon	14	10017	34	153	3499
Schoolcraft	35	25225	251	172	3779
Wexford	291	70268	2287	2050	4992
TOTAL 2	22096	2181336	75771	59474	64813

 To Convert From Pounds (1b)
 To Kilograms (kg)
 Multiply By 0.454

 Tons (ton)
 Kilograms (kg)
 907.2

 Metric Tons
 0.907

5.5.2.1 Agricultural Chemicals

There were 1,002,250 kilograms (2,209,640 pounds) of agricultural chemicals used in PSA 2.4. Herbicides represented 34 percent of the total, insecticides 31 percent, and fungicides 35 percent. This is the highest percentage of fungicides in the Lake Michigan basin. Herbicide use may increase about 10-25 percent in the next 10 years, and fungicide use about 5-10 percent. Insecticide use may increase 30-40 percent in the next 5 years, but decrease to about present levels within 10 years.

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan

PLANNING SUBAREA: Northeast 2.4

COUNTY: 21 County Totals

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	108360	2979.2	21:080	361.2		
Grains	35940	178.9	11980	119.2		
Hay or Grass Silage	68530	68h.4	571.09	570.2		
Pastured Cropland	53592	535.1	53592	535.1	1182	
Other Field Crops	8294	235.2	6621	746.8	6491	873.2
Vegetables	20115	860.4	111968	819.6	14017	913.0
Orchards						_
Berries	1,6603	2026.0	511795	3714.3	5/190/1	5814.2
Nursery, Greenhouse			15001100-00		0.05.00	
Other Crops						
Totals		7/199.2		6866.1	75/112	_7730.4
Total Herbicides, In	secticide	s, Fungio	ides: 10	0 1bs	600321	22096.4

Hog & Pig		Hog & Pig Number Sows Farrowing			
lear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
964	30767	3120	3172	6292	
969	26309	2596	2472	5068	
1972	27990	3208	2646	5854	

1972 2	7990	3208	2646	5854
Wet Manure F.	actor: Tons	per litter farrowe	d 7.23	
Wet Manure D			42327	
Nutrients in	Wet Manure:	Nitrogen, tons	212	
		Phosphorus, tons	59	
		Potash, tons	161	

TABLE	3-MANURE	FROM	CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	201521	89453	115071
1969	177203	76298	100905
1972	193600	82100	111500
Wet Manure Per Anima	Factor: Tons	13.14	6.45
Wet Manure Tons, 197		1078794	719175
	Defecated: Tons, 1972 n Wet Manure: Nitroge	n, tons 10069	
		rus, tons 1798 tons 8990	

TABLE	4MANURE	FROM	SHEEP	AND	HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	16449	-
1969	14188	5857
1972	11485	22261
Wet Manure Factor: Tons per animal	1.61	12.78 284496
Wet Manure Defecated: Tons, 1972	18491	
Nutrients in Wet Manure: Nitrogen, Tons	259	1963
Phosphorus, Tons	39 185	284
Potash, Tons	185	1707

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		817355	-	-
1969		839040	-	-
1972		765900	1,0000	100000
Wet Manure Fact	or: Lbs. per bird	B2.9	365.0	89.63
wet Manure Defe	cated: Tons, 1972	31746		
Nutrients in We	t Manure: Nitrogen, tons	495	Combined	6307 98
	Phosphorus, tons	127	-	25
	Potash, tons	171	-	22

TARTE	6-CDOD	ACDVACES	E	PERTITIER	USEDCLASS	T-V	CENSUS	FARMS.	1969
LADLE	DCRUE	ACREAGES	SX.	LEWITPITEL	DODDCHUDO		CHARLOS	action series	2202

COUNTY, land area, acres	(1) 8125696	Number I-V farms	4881
Number of farms	8757	Acres in I-V farms	1121924
Acres in farms	1516220	Cropland I-V farms	693384
Cropland in farms	907655	Harvested cropland	
Harvested cropland in fa	rms 193782	I-V farms	417964

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	84194	11480	1207	12687
GRAINS	55046	5719	67	5786
Wheat	13795	1496	20	1516
Oats	34993	3732	40	3772
Barley	90h	89	-	89
Rye	1,006	246	14	250
OTHER FIELD CROPS	111/70	4252	711	14963
Soybeans	1469	15		15
Potatoes	6491	3580	701	4281
Sugar beets	-	-	-	-
Field beans	2745	9	-	9
HAY OR GRASS SILAGE	175442	2572	46	2618
PASTURED CROPLAND	165053	1645	6	1651
Cropland used for pasture	149119	1473	5	1478
Improved pasture	15934	172	1	173
VEGETABLES, SWEET CORN, MELONS	19604	5458	94	5552
ORCHARDS	69314	12823	563	13386
BERRIES	2027	564	14	578
NURSERY & GREENHOUSE PRODUCTS	381	65 58	2	67
OTHER CROPS	524		+	58
Total Fertilizer Used, Tons	40.00	44636	2710	47346
Percent of Fertilizer Used		94	6	100

# TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

	AFFLIED				
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	63648	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	12123	1972	111928	11/51/6	59474
Total	75771			er Recent Yes	
Primary Nutrients in Fertilizer	37128	100	mages for our	The content of	-
Nitrogen	12252				
Phosphorus	11880				
Potash	12996				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	40074	17.0
1971-72	14314314	17.1
1072-73	1,1,685	17.0
Total Estima As Comput	ted Tons Applied on All Hi	ghways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides	8 Insec 6866.4	ticides	Fungicides 7730.4	Total 22096.0
Manure: Kind	of	Tons o	f Materials		
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Table	2	42327	212	59	161
Cattle: Table		1797969	1,0069	1798	8990
Sheep: Table		18491	259	39	185
Horses: Table		281/196	1963	284	1707
	le 5	31746	495	127	111
Turkeys: Tabl		6307	98	25	22
Total from Liv		2181336	13096	2332	11176

Tous	22172330			
Fertilizers:	Tons of	Commercial Fer	tilizers Applied	d
IULUALION		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	75771	12252	11880	12996

Lime:	Limestone Table 8	purchased or applied,	tons:
	S121-11-11-11-11-11-11-11-11-11-11-11-11-	ways tons: Table 9	64813

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan

PLANNING SUBAREA: Northeast 2.4

COUNTY: Antrim

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	2700	74.2	600	9.0		
Grains	780	3.9	260	2.6		
Hay or Grass Silage	2380	23.7	1983	19.8		
Pastured Cropland	2121	21.2	2121	21.2		
Other Field Crops	601	18.0	668	76.8	668	100.2
Vegetables						
Orchards						
Berries	2108	87.7	21,28	147.6	2430	214.5
Nursery, Greenhouse						
Other Crops						

TABLE			

Totals 10690 228.7 8060 Total Herbicides, Insecticides, Fungicides:

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1978	280	254	534
1969	1730	258	270	528
1972	1.800	300	300	600

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

# TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves
1964 1969	7266 6188	3201 2660	4065 3528
1972	6700	2900	3800
Wet Manure Per Animal	actor: Tons	13.14	6.45
Wet Manure I Tons, 1972		38106	24510
Wet Manure I	Defecated: Tons, 19 n Wet Manure: Nitr Phos	72 Combined: 62616	

# TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	406	
1969		185
1972	510 400	524
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	Guli	6697
Nutrients in Wet Manure: Nitrogen, Tons	9	46
Phosphorus, Tons	s 1	7
Potash, Tons	6	10

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		58132		
1969		69890		1
1972		65000	10000	100000
Wet Manure Fact	or: Lbs. per bird	82.9	365.0	89.63
Wet Manure Defe	cated: Tons, 1972	2694	13783	07.00
Nutrients in We	Manure: Nitrogen, tons	42	Combined	6307
	Phosphorus, tons	11		98 25
	Potash, tons	9		22

## TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	(1) 301320	Number I-V farms 197	
Number of farms	3/17	Acres in I-V farms 498	15
Acres in farms	69929	Cropland I-V farms 295	57
Cropland in farms	38137	Harvested cropland	
Harvested cropland in	farms 18493	I-V farms 156	811

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	3155	1462	17	479
GRAINS	1584	2117	0	147
Wheat	165	19	0	1.9
Oats	1154	121	0	121
Barley	0			1
Rye	265	6	0	6
OTHER FIELD CROPS	692	451	0	451
Soybeans				
Potatoes	668	145	0	1415
Sugar beets		1000		
Field beans	372	1	0	82
HAY OR GRASS SILAGE	5866	82	0	82
PASTURED CROPLAND	6833	63	0	63
Cropland used for pasture	5733	112	0	142
Improved pasture	1100	21	0	21 52
VEGETABLES, SWEET CORN, MELONS	208	52	0	52
ORCHARDS	3787	853	32	885
BERRIES	36	6	0	6
NURSERY & GREENHOUSE PRODUCTS	3	0	0	0
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		2117	49	2166
Percent of Fertilizer Used		98	2	100

TABLE 7FERTILIZER	USED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	2911	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	555	1972	931	150	1081
Total	3466		nnoon For Oth	er Recent Yea	
Primary Nutrients in Fertilizer	1698	101	mages for oth	Necent 160	-
Nitrogen	560				-
Phosphorus	543				
Potash	594				

### TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Through State	"E" Mile
1970-71	1963	17.2
1971-72	1706	15.1
1972-73	2010	10.5

## TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Hulle	Hedweight Ap	plied on Cro	pianu	
Table 1	Herbicides 228.7	The state of the s	ticides 7.0	Fungicides 314.7	Total 1076.2
Manure: Kind				in Wet Manure De	
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Table	2	14338	68	17	15
Cattle: Table	2 3	6261.6	351	63	313
Sheep: Table	4	6144	9	1	6
Horses: Table	2 4	6697	146	7	40
Chickens: Tal	ole 5	2694	42	11	9
Turkeys: Tab.	le 5	6307	98	25	22
Total from Liv	vestock,	83296	614	124	770

Fertilizers:	Tons of	Commercial Fer	tilizers Applied	1
		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	3466	560	543	594

Lime: Limestone equivalent purchased or applied, tons: Table 8 1081

Salts: Applied on all highways, tons: Table 9 2915

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan PLANNING SUBAREA: Northeast 2,4 COUNTY: Benzie

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	630	17.3	140	2.1		
Grains	50	.3	20	.2		
Hay or Grass Silage	571	5.7	476	4.7		
Pastured Cropland	1020	10.2	1020	10.2		
Other Field Crops		-102.46		120000000000000000000000000000000000000		
Vegetables						
Orchards	2502	109.7	2922	226.0	2922	443.2
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	4783	143.2	4578	243.2	2922	443.2

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1272	16	14	30
1969	3442	285	291	576
1972	3500	400	300	700

Wet Manure Defecated: Tons, 1972

Nutrients in Wet Manure: Nitrogen, tons

Phosphorus, tons Potash, tons

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	1954	863	1091		
1969	1946	802	1144		
1972	2100	900	1200		
Wet Manure H	Pactor: Tons	13.14	6.45		
Wet Manure I		11826	7740		
Wet Manure I	Defecated: Tons, 1972 Wet Manure: Nitroge	n, tons 110	56		
	Phospho Potash.	tons 98			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	0	
1969	47	115
1972	50	385
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	81	4665
Nutrients in Wet Manure: Nitrogen, Tons	1	32
Phosphorus, Tons	0	5
Potash, Tons	1	28

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		13845		
1969		1675		
1972		1900		
Wet Manure Fact	or: Lbs. per bird	82.9		
Wet Manure Defe	cated: Tons, 1972	79		
Nutrients in We	et Manure:		Combined	
	Nitrogen, tons	1		
	Phosphorus, tons	0	_	
	Potash, tons	0		-

TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres Number of farms	201920	Number I-V farms 127 Acres in I-V farms 27951
Acres in farms	38771	Cropland I-V farms 13627
Cropland in farms	18154	Harvested cropland
Harvested cropland in farms	8378	I-V farms 7234

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	805	108	65	173
GRAINS	356	27	0	27
Wheat	59	6	0	6
Oats	150	7	0	7
Barley	0			1000
Rye	147	14	0	14
OTHER FIELD CROPS	0			
Soybeans	0			
Potatoes	0			
Sugar beets				
Field beans				
HAY OR GRASS SILAGE	1201	39	0	39
PASTURED CROPLAND	2965	50	0	50
Cropland used for pasture	2803	47	0	47
Improved pasture	162	3	0	3
VEGETABLES, SWEET CORN, MELONS	27	7	0	7
ORCHARDS	4841	1059	74	1133
BERRIES	48	26	0	26
NURSERY & GREENHOUSE PRODUCTS	19	1	0	1
OTHER CROPS	0			-
Total Fertilizer Used, Tons		1317	139	1456
Percent of Fertilizer Used				

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED					
Item	Tons		Tonnage	Tonnage not				
Fertilizer Used on Crops: Solid	1957	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage			
Liquid	373	1972	1260	934	2194			
Total	2330		Tonnages for Other Recent Years					
Primary Nutrients in Fertilizer	1142	100	nages for our	L W COME 100				
Nitrogen	377				-			
Phosphorus	365							
Potash	400							

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per
1970-71	1384	16.7
1971-72	1229	14.9
1972-73	1624	18.5
Total Estim As Compu	ated Tons Applied on All ted 2356	Highways in 1972-73,

MADY OF ACRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1 143.2		s Insecticides		Fungicides	Total
Table 1	143.2		-	443.2	829.6
Manure: Kind of Livestock		Tons		ls in Wet Manure D	
		Manure	Nitroge	en Phosphorus	Potash
Swine: Tal		5061	79	20	1.8
Cattle: T		19566	110	20	98
Sheep: Tal		81	1	0	1
Horses: Table 4		4665	32	5	28
Chickens: Table 5		79	1	0	0
Turkeys: Table 5		0	0	0	0
Total from Livestock, Tons		29452	223	45	145
Fertilizer	at	Tons of (	commercial !	Fertilizers Applie	d
1010111			Pr	imary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7		1142	377	365	400
	estone equiva	lent purchas	ed or appl:	ied, tons:	

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: Michigan PLANNING AREA: Lake Michigan 2.0 COUNTY: Charlevoix

PLANNING SUBAREA: Northeast 2.4

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972 Herbicides Insecticides Fungicides Crop Group Amount Amount Amount Acres Used Acres Used 100 lbs Acres Used 100 1bs Crops Treated 100 lbs Treated Treated 2700 816 74.2 9.0 Corn Grains Hay or Grass Silage 2560 2555 Pastured Cropland Other Field Crops Vegetables 10.2 68 61 Orchards Berries Nursery, Greenhouse Other Crops 11.0 257 Totals 8949 142.1 5919 88.9 Total Herbicides, Insecticides, Fungicides: 100 lbs

2MANURE	

	Hog & Pig	og & Pig Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1092	129	125	254
1969	560	59	55	114
1972	600	60	55	115

Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons 831 Phosphorus, tons Potash, tons

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	8106	3817	4289
1969	6565	3157	3408
1972	7200	3400	3800
Wet Manure F Per Animal	actor: Tons	13.14	6.45
Wet Manure I	PSGN0100000000000000000000000000000000000	44676	24510
Wet Manure I	efecated: Tons, 1972	Combined: 69186	
Nutrients in	Wet Manure: Nitroger	n, tons 387	
	Phospho	rus, tons 69	
	Potash,	tons 346	

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	226	
1969	232	316
1972	200	1291
Wet Manure Factor: Tons per animal	1,61	12.78
Wet Manure Defecated: Tons, 1972	322	16499
Nutrients in Wet Manure: Nitrogen, Tons	5	114
Phosphorus, Tons	1	16
Potash, Tons	3	99

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		20790		
1969		21320		
1972		23600		
Wet Manure Factor	: Lbs. per bird	82.9		
Wet Manure Defeca		978		
Nutrients in Wet	Manure: Nitrogen, tons	15	Combined	
	Phosphorus, tons	4		
	Potash, tons	3		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	265088	Number I-V farms 121
Number of farms	278	Acres in I-V farms 34668
Acres in farms	51109	Cropland I-V farms 19604
Cropland in farms	27473	Harvested cropland
Harvested cropland in far	ns 13461	I-V farms 10785

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	2657	431	0	431
GRAINS	1126	149	0	149
Wheat	147	17	0	17
Oats	806	101	0	101
Barley	75	4	0	4
Rye	18	2	0	2
OTHER FIELD CROPS	187	24	1	25
Soybeans				
Potatoes	68	6	0	6
Sugar beets				
Field beans	16	0	0	0
HAY OR GRASS SILAGE	6242	80	0	80
PASTURED CROPLAND	5767	27	0	27
Cropland used for pasture	6291	25	0	25
Improved pasture	476	2	0	
VEGETABLES, SWEET CORN, MELONS	132	39	0	39
ORCHARDS	565	57	0	57
BERRIES	0			
NURSERY & GREENHOUSE PRODUCTS	0		- 31	
OTHER CROPS	0			
Total Fertilizer Used, Tons		807	1	808
Percent of Fertilizer Used		100	0	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

THOUSE I THE STATE OF THE STATE			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	1086	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	207	1972	1150	400	1550
Total	1293			er Recent Yea	
Primary Nutrients in Fertilizer	534	101	mages for our	IET RECERC TO	-
Nitrogen	209				
Phosphorus	203				
Potash	222				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1339	17.1
1971-72	1438	18.5
1972-73	1700	20.5
Total Estima	ted Tons Applied on All Hi	ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	To a	ecticides	Fungicides	Total
Table 1	142.1		88.9	57.1	288,1
Manure: K	ind of	Tons	of Material	s in Wet Manure D	efecated
Livesto	ck	Manure	Nitroge	n Phosphorus	Potash
Swine: Tal	ole 2	831	13	3	3
Cattle: T	able 3	69186	387	69	346
Sheep: Tal	ble 4	322	5	1	3
Horses: T	able 4	16499	114	16	99
Chickens:	Table 5	978	15	4	3
Turkeys:	Table 5	0	0	0	0
Total from Tot	Livestock,	87816	534	93	454
Fertilizer	s:	Tons of	Commercial 1	Fertilizers Applie	d
		+////	Pri	imary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	1293	209	203	222

ent purchased or applied, to Table 8 1550

Salts: Applied on all highways, tons: Table 9 2465

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan PLANNING SUBAREA: Northeast 2.4 \_\_ COUNTY: Delta

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn						
Grains	3804	19.0	1268	12.6		
Hay or Grass Silage	4429	44.2	3691	36.9		
Pastured Cropland	4534	45.3	4534	45.3		
Other Field Crops	412	12.3	458	52.6	458	68.7
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	13179	120.8	9951	147.4	458	68.7

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1		June 1-Nov. 30 Fall	Total
964	308	20	26	46
1969	203	24	34	58
1972	200	24	34	58

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 419
Nutrients in Wet Manure: Nitrogen, tons 2 Phosphorus, tons Potash, tons

TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	13463	7394	6069
1969	11003	5917	5086
1972	12000	6400	5600
Wet Manure Per Anima	Factor: Tons	13,14	6.45
Wet Manure Tons, 197		84096	36120
Wet Manure	Defecated: Tons, 1972 n Wet Manure: Nitrog	Combined: 12021	
		. tons 601	

TABLE 4--MANURE FROM SHEEF AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	97	
1969	175	175
1972	100	532
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	161	6799
Nutrients in Wet Manure: Nitrogen, Tons	2	47
Phosphorus, Tons	0	7
Potash, Tons	2	41

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	25137		
1969	34431		
1972	29300		
Wet Manure Factor: Lbs. pe	r bird 82.9		
wet Manure Defecated: Tons	, 1972   1214		
Nutrients in Wet Manure: Nitrogen,		Combined	
Phosphorus			
Potash, to			-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	752960	Number I-V farms	250
Number of farms	373	Acres in I-V farms	78795
Acres in farms	101542	Cropland I-V farms	39254
Cropland in farms	49165	Harvested cropland	
Harvested cropland in farms	24252	I-V farms	20606

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	1070	201	0	201
GRAINS	5372	517	2	519
Wheat	7	5	0	5
Oats	4947	474	2	476
Barley	290	28	0	28
Rye	73	2	0	2
OTHER FIELD CROPS	959	285	2	287
Soybeans				
Potatoes	458	233	0	233
Sugar beets		2000		10000
Field beans	52	0	0	0
HAY OR GRASS SILAGE	12549	97	0	97
PASTURED CROPLAND	15213	162	0	162
Cropland used for pasture	13294	143	0	143
Improved pasture	1919	19	0	19
VEGETABLES, SWEET CORN, MELONS	628	118	0	118
ORCHARDS	9	0	0	0
BERRIES	23	8	0	8
NURSERY & GREENHOUSE PRODUCTS	1	0	0	0
OTHER CROPS	3	1	0	1
Total Fertilizer Used, Tons		1389	4	1393
Percent of Fertilizer Used		100	0	100

TABLE 7--FERTILIZER USED IN

	Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
_	1972	91	0	91

Item Tons Fertilizer Used 1872 357 2229 on Crops: Solid Liquid Total Primary Nutrients in Fertilizer Nitrogen Phosphorus 1092 360 349 383 Potash

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2943	21.0
1971-72	2740	19.5
1972-73	3190	21,2

	Herbicide	s Ins	ecticides 147.4	Fungicides 68.7	Total 336.9
Table 1	120.8				
Manure: Kind of Livestock				s in Wet Manure De	
		Manure	Nitroge	n Phosphorus	Potasi
Swine: Table 2		419		2	1
Cattle: Table 3		120216	673	120	601
Sheep: Table 4		161	2	0	2
Horses: Table 4		6799	47	7	41
Chickens: Table 5		1214	19	5	4
Turkeys: Table 5		0	0	0	0
Total from Livestock, Tons		128809	748	134	649
Fertilizer:	s:	Tons of		Pertilizers Applied	
The sales of the sales			Pri	mary Nutrients	
Ite	em	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7		2229 360		349	383
	estone equiva		sed or appli	led, tons:	

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals	, Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
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PLANNING AREA: Lake Michigan 2.0 STATE: Michigan
PLANNING SUBAREA: Northeast 2.4 COUNTY: Emmet

TABLE 1 PRITMATED AMOINTS OF CHEMICALS HISED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	2250	61.8	500	7.5		
Grains	918	4.5	305	3.0		
Hay or Grass Silage	2926	29.2	2438	24.3		
Pastured Cropland	2270	22.7	2270	22.7		
Other Field Crops	412	12.3	458	52.6	458	68.7
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
					3	
Totals	0776	130.5	5072	110.1	458	68.7
Total Herbicides, In	8776				15206	309.3

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sov	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1389	246	203	1449
1969	307	25	18	43
1972	300	25	15	40

Wet Manure Factor: Tons per litter farrowed 7,23
Wet Manure Defecated: Tons, 1972 289
Nutrients in Wet Manure: Nitrogen, tons 1
Phosphorus, tons 0
Potash, tons 1

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year Total		Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	8762	4102	4660			
1969	7186	3374	3812			
1972	7900	3700	4200			
Wet Manure Per Anima	Factor: Tons	13.14	6.45			
Wet Manure Tons, 197		48618	27216			
	Defecated: Tons, 1972 m Wet Manure: Nitroge Phospho Potash.	en, tons 425 orus, tons 76	ţ.			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	664	
1969	848	165
1972	700	806
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1127	10301
Nutrients in Wet Manure: Nitrogen, Tor	is 16	71
Phosphorus, 1		10
Potash, Tons	11	52

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	50489		
1969	58935		
1972	58935 <b>65</b> 800		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	2727		
Nutrients in Wet Manure: Nitrogen, tons	143	Combined	
Phosphorus, tons Potash, tons	11 10		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	291,720	Number I-V farms	120
Number of farms	21.8	Acres in I-V farms	38052
Acres in farms	56907	Cropland I-V farms	20151
Cropland in farms	28045	Harvested cropland	
	15226	I-V farms	12140

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	2511	409	38	1447
GRAINS	1786	213	1	214
Wheat	184	30	1	31
Oats	1534	178	0	178
Barley	19	2	0	3
Rye	19	3	0	3
OTHER FIELD CROPS	512	263	0	263
Soybeans	54	0	0	0
Potatoes	1458	263	0	263
Sugar beets				
Field beans	38	2	0	2
HAY OR GRASS SILAGE	7277	133	0	133
PASTURED CROPLAND	66/19	71/1	0	11/1
Cropland used for pasture	6074	130	0	130
Improved pasture	575	11,	0	114
VEGETABLES, SWEET CORN, MELONS	74	34	2	36
ORCHARDS	39	17	0	17 8 0
BERRIES	9	8	0	8
NURSERY & GREENHOUSE PRODUCTS	1	0	0	
OTHER CROPS	1	0	0	0
Total Fertilizer Used, Tons		1223	41	1264
Percent of Fertilizer Used		97	3	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	1698	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	324	1972	261	94	355
Total	2022			er Recent Yes	
Primary Nutrients in Fertilizer	991	101	mages for our	The content	
Nitrogen	327				
Phosphorus	317				
Potash	347				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2323	19.4
1971-72	2351	19.8
1972-73	50/1/7	16.1
Total Estima As Comput		1 Highways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Inse	cticides	Fungicides	Total
Table 1	130.5	110	.1	68.7	309.3
Manure: Kin	d of	Tons	of Materials	in Wet Manure De	fecated
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Tabl	e 2	289	5	1	1
Cattle: Tab		75834	425	76	379
Sheep: Tabl	e 4	1127	16	2	11
Horses: Tab	le 4	10301	71	10	52
Chickens: 7	able 5	2727	43	11	10
Turkeys: Ta	ble 5	0	0	0	0
Total from I	Service Control of the Control of th	90278	560	100	1453
Fertilizers:		Tons of C		rtilizers Applied	
			Prim	ary Nutrients	
Item	0	Total	Nitrogen	Phosphorus	Potasi
Applied on (	Cropland:	2022	327	317	347

Applied on Cropland: 2022 327 317 347

Lime: Limestone equivalent purchased or applied, tons: 355

Salts: Applied on all highways, tons: Table 9 2965

To Convert From

Pounds (1b) Acres (acre) Tons (ton) Kilograms (kg)
Hectare (ha)
Kilograms (kg)

Multiply By 0.453 .4047 907.2

Agricultural	Chemicals	Manures	Fortilizers	1.4 me	and	Hi ohway	Do-Tring	Compounds
uktrententar	onemrears.	running 60 8	Territorio!	ALT HAR	GILLIA	HT SHAGA	De retue	Compounds

PLANNING AREA:	Lake Michigan 2.0	STATE:	Michigan	
PLANNING SUBAREA:	Northeast 2.h	COUNTY:	Grand Traverse	

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	1,770	131.1	1060	15.9		
Grains	1326	6.6	1412	4.4		
Hay or Grass Silage	3073	30.7	2560	25.6		
Pastured Cropland	1965	19.6	1965	19.6		
Other Field Crops	10	.2	11	1.2	11	1.6
Vegetables	548	11.5	315	18.0	147	22.3
Orchards						
Berries	8822	358.5	10196	574.2	10198	716.2
Nursery, Greenhouse						
Other Crops						
Totals	20514	558.2	16549	658.9	10656	740.1

TARTE	2MANURE	EDUM	SUTNE

Hog & Pig		ws Farrowing	
Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1940	21/4	215	1429
1348	93	911	187
11:00	100	100	200
	Dec. 1 1940 1348	Dec. 1 Spring 1940 214 1348 93	Dec. 1         Spring         Fall           1940         23h         215           1348         93         9h

		Cows & Heifers	11 12 0
Year	Total	Calved	Heifers, Steers, Bulls, Calves
1964	7101	21/19	4652
1969	6786	2349	4437
1972	7400	2600	4800
Wet Manure Fa	ctor: Tons	13.14	6.45
Wet Manure De Tons, 1972	fecated:	34164	30960

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	304	
1969	214	742
1972	200	1889
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	322	ZhThT
Nutrients in Wet Manure: Nitrogen, Tons	5	167
Phosphorus, To		211
Potash, Tons	3	1/15

TABLE S-MANIPE PROM CUTOVENS & THEPPEYS

Chickens	Turkey Hens	Turkeys Raised
89267		
50600		
82.9		
33	Combined	
8		
	89267 8150k 50600 82.9 2097	89267 81501 50600 8219 2097 Combined

TABLE 6-CROP ACREACES & PERTILIZER HISED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	295808	Number I-V farms	365 57905
Number of farms	633	Acres in I-V farms_	
Acres in farms	83712	_ Cropland I-V farms_	38148
Cropland in farms	51292	Harvested cropland	25168
Harvested cropland in farms	29771	I-V farms	55100

	Crop	Tons o	Tons of Fertilizer U			
Crops	Acres	Dry	Liquid	Tota		
CORN	3151	1440	514	14911		
GRAINS	1503	176	0	176		
Wheat	434	62	0	62		
Oats	873	98	0	98		
Barley						
Rye	136	6	0	6		
OTHER FIELD CROPS	200	26	0	26		
Soybeans	15	.0	0	0		
Potatoes	11	2	0 /	2		
Sugar beets						
Field beans	78	0	0.	0		
HAY OR GRASS SILAGE	7296	120	1	121		
PASTURED CROPLAND	51:31	98	1	99		
Cropland used for pasture	51hh	87	1	88		
Improved pasture	287	11	0	11		
VEGETABLES, SWEET CORN, MELONS	537	84	0	84		
ORCHARDS	12434	2722	72	2794		
BERRIES	56	11	0	21		
NURSERY & GREENHOUSE PRODUCTS	2	0	0	0		
OTHER CROPS	70	11	0	11		
Total Fertilizer Used, Tons		3688	128	381.6		
Percent of Fertilizer Used		97	3	1.00		

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED				
Item	Tons 5129		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid		Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	977	1972	1254	346	1600		
Total	6106	Tonnages for Other Recent Years					
Primary Nutrients in Fertilizer	2992	100	mages tot ver		-		
Nitrogen	987						
Phosphorus	957						
Potash	1048						

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	973	9.7
1971-72	1156	11,6
1972-73	1565	14.7
Total Estima	ated Tons Applied on All H	ighways in 1972-73,

OF ACRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	THE RESIDENCE OF THE PARTY OF T	cticides 8.9	Fungicides 740.1	Total 1957.2
Table 1	558,2			The second secon	
	ind of	Tons Manure	of Materials Nitroger	in Wet Manure l	
Livesto	ole 2	1hh6	23	6	5
Swine: Tab Cattle: Ta		65124	365	65	326
Sheep: Tab		322	5	1	3
Horses: Ta		24741	167	24	145
Chickens: Table 5 Turkeys: Table 5 Total from Livestock, Tons		2097	33	8	7
		0	0	0	0
		93130	593	104	355
Fertilizer		Tons of C	ommercial Fe	ertilizers Applie	ed
reitilizer	0.1			mary Nutrients	
Ite	em	Total	Nitrogen	Phosphorus	Potasi
Applied on Table 7	Cropland:	6106	987	957	1048
	estone equivalentes	nt purchas	ed or applie	ed, tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
PLANNING AREA	: Lake	Michigan	2.0	STATI	E:	Michiga	an	

PLANNING SUBA	AREA: Northeast 2.4	COUNTY: Kalkaska	

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972	

or Acres Used Acres Used		Herbicides		Insecticides		Fungicides	
Grains         210         1.0         70         .7           Hay or Grass Silage         862         8.6         718         7.1           Pastured Cropland         935         9.3         935         9.3           Other Field Crops         153         1.5         170         19.5           Vegetables         0rchards         0rchards         0rchards           Berries         Nursery, Greenhouse         0rchards         0rchards	or		Used		Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Hay or Grass Silage   862   8.6   718   7.1     Pastured Cropland   935   9.3   935   9.3     Other Field Crops   153   1.5   170   19.5     Vegetables   Orchards     Berries     Rursery, Greenhouse	Corn	1170	32.1	260	3.9		
Hay or Grass Silage 862 8.6 718 7.1 Pastured Cropland 935 9.3 935 9.3 Other Field Crops 153 1.5 170 19.5 Vegetables Orchards Berries Nursery, Greenhouse	Grains .	210		70			
Pastured Cropland   935   9.3   9.3   9.3     Other Field Crops   153   1.5   170   19.5     Vegetables   Orchards     Berries     Nursery, Greenhouse	lay or Grass Silage	862		718	7.1		
Other Field Crops 153 h.5 170 19.5 Vegetables Orchards Berries Nursery, Greenhouse	astured Cropland		9.3		9.3		
Vegetables Orchards Berries Nursery, Greenhouse	ther Field Crops					170	25.5
Berries Nursery, Greenhouse	Vegetables						
Nursery, Greenhouse	rchards						
Other Crops	dursery, Greenhouse						
	Other Crops						
Totals 3330 55.5 2153 10.5	Control of the Contro	2020	22.2	0170	10.2	2.00	25.5
Totals 3330 55.5 2153 h0.5 Total Herbicides, Insecticides, Fungicides: 100 lbs						170 5653	25.5

## TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
fear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	h16	55	59	11/1
1969	511	23	18	hl
1972	50	20	20	110

1972	50	20	20	110
Wet Manure	Factor: To	ns per litter farrowed	7.23	
Wet Manure	Defecated:	Tons, 1972	289	
Nutrients	in Wet Manur	e: Nitrogen, tons	1	
		Phosphorus, tons	0	
		Potash, tons	1	

		Number Cattle	Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	311/4	1371	1743			
1969	2147	837	1310			
1972	21,00	900	1500			
Wet Manure F Per Animal	actor: Tons	13,14	6.45			
Wet Manure I Tons, 1972		11826	9675			

### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	0.	
1969	.80	71/3
1972	80	380 380
Wet Manure Factor: Tons per animal	1,61	12.78
Wet Manure Defecated: Tons, 1972	129	1,856
Nutrients in Wet Manure: Nitrogen, Tons	2	34
Phosphorus, Tons	0	5
Potash, Tons	1	29

# TABLE 5-HANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys
1964	1,3827		
1969	76861		
1972	85900		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	3561		
Nutrients in Wet Manure: Nitrogen, tons	56	Combined	
Phosphorus, tons	114		
Potash, tons	12		-

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres_	361984	Number I-V farms	148
Number of farms	122	Acres in I-V farms	13163
Acres in farms	23686	Cropland I-V farms	7940
Cropland in farms	12859	Harvested cropland	A-ACONG
Harvested cropland in farm	s 4300	I-V farms	3447

	Crop	Tons o	f Fertilize	Used
Crops	Acres	Dry	Liquid	Total
CORN	668	97	0	97 36 5
GRAINS	316	36 5	0	36
Wheat	147	5	0	5
Oats	10h	15	0	15
Barley				
Rye	165	15	0	15
OTHER FIELD CROPS	181	11:9	0	149
Soybeans				
Potatoes	170	147	- 0	147
Sugar beets				
Field beans	16	0	0	0
HAY OR GRASS SILAGE	2201	33	0	33 1h
PASTURED CROPLAND	2156	7/4	0	14
Cropland used for pasture	20lili	14	0	111
Improved pasture	112	0	0	0
VEGETABLES, SWEET CORN, MELONS				
ORCHARDS	2	1	0	1
BERRIES	1	0	0	0
NURSERY & GREENHOUSE PRODUCTS				
OTHER CROPS				
Total Fertilizer Used, Tons		330	0	330
Percent of Fertilizer Used		100	0	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED	Y	
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	lilili	Year	Government Cost/Shared	Government	Total Tonnage
Liquid	84	1972	1364	52	21/16
Total	528		1000000	er Recent Yea	
Primary Nutrients in Fertilizer	259	100	mages for Oth	er mecent rea	-
Nitrogen	85				
Phosphorus	83				
Potash	91				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	861	11.1
1971-72	1244	16.1
1972-73	1674	20.4
Total Estima	ted Tons Applied on All H	lighways in 1972-73,

# TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

-							
	Herbicides	Insec	ticides	Fungicides	Total		
Table 1	55.5	40,5		25.5	121.5		
Manure: Kind of		Tons o	f Materials i	in Wet Manure De	fecated		
Livesto	k	Manure	Nitrogen	Phosphorus	Potash		
Swine: Tab	1e 2	289	5	1	1		
Cattle: Ta	ble 3	21501	120	22	108		
Sheep: Tab	le 4	129	2	0	1		
Horses: Ta	ble 4	1,856	33	5	29		
Chickens:	Table 5	3561	56	111	12		
Turkeys: I	able 5	0	0	0	0		
Total from Ton		30336	217	112	151		
Fertilizers		Tons of Co		ilizers Applied			
		-		ry Nutrients			
Ite		Total	Nitrogen	Phosphorus	Potash		
Applied on	Promined.						

			tilizers Applied ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	528	85	83	91

Line:	Limestone Table 8	equivalent	purchased	or	applied,	tons:
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Salts: Applied on all highways, tons: Table 9 2128

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA:	Lake Michigan 2.0	STATE:	Michigan
PLANNING SUBAREA	Northeast 2.h	COUNTY:	Take

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS,	1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	1260	34.6	280	4.2		
Grains	720	3.6	240	2.4		
Hay or Grass Silage	1325	13.2	1104	11.0		
Pastured Cropland	1800	18.0	1800	18.0		
Other Field Crops	14	.14	16	1.8	16	2.4
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	5119	69.8	311/10	37.4	16	2.4

#### TABLE 2-MANUER FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	430	211	35	59
969	211	9	20	29
1972	200	9	20	29

1972 200	9	50	29
Wet Manure Facto	r: Tons per litte	er farrowed 7.23	
	ated: Tons, 1972	210	
Nutrients in Wet	Manure: Nitroger	n, tons 1	
	Phosphor	rus, tons 0	
	Potash,	tons 1	

# TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	3775	1805	1970			
1969	3536	1739	1797			
1972	3900	1900	2000			
Wet Manure   Per Anima	Factor: Tons	13.14	6.45			
Wet Manure 1		24966	12900			

# TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	674	
1969	270	83
1972	100	1,00
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	161	5112
Nutrients in Wet Manure: Nitrogen, Tons	2	35
Phosphorus, Ton	9 0	5
Potash, Tons	2	31

## TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	3075		
1969	7984		
1972	8500		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	352		
Nutrients in Wet Manure: Nitrogen, tons	5	Combined	17 - 1936
Phosphorus, tons Potash, tons	1	_	

#### TABLE 6\_COOP ACPEACES & FERTILIZER HISED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 365372	Number I-V farms	78
Number of farms	152	Acres in I-V farms	20695
Acres in farms	31057	Cropland I-V farms	11963
Cropland in farms	16831	Harvested cropland	
Harvested cropland in fa	rms 6376	I-V farms_	5059

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	667	79	10	89
GRAINS	8hh	91	0	91
Wheat	250	28	0	28 55
Oats	517	55	0	55
Barley	14	1	0	1
Rye	29	1	0	1
OTHER FIELD CROPS	66	10	0	10
Soybeans				
Potatoes	16	6	0	6
Sugar beets				
Field beans	139	0	0	0
HAY OR GRASS SILAGE	3362	30	0	30
PASTURED CROPLAND	5615	13	0	13
Cropland used for pasture	5489	13	0	13
Improved pasture	126	0	0	0
VEGETABLES, SWEET CORN, MELONS				
ORCHARDS				1
BERRIES				
NURSERY & GREENHOUSE PRODUCTS				
OTHER CROPS		-		
Total Fertilizer Used, Tons		223	10	233
Percant of Fertilizer Used		96	4	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	The same of
Fertilizer Used on Crops: Solid	313	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	60	1972	961	100	1061
Total	373			er Recent Yes	rs
Primary Nutrients in Fertilizer	1.83	200	nages tox van	100.00000	-
Nitrogen	60				
Phosphorus	59				
Potash	64				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1092	20.5
1971-72	9911	18.8
1972-73	1213	21.5
Total Est As Com	imated Tons Applied on All B	ighways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Salts: Applied on all highways, tons: Table 9 1759

	Herbicides	Ins	ecticides	Fungicides	Total
Table 1	69.8		37.4	2.4	109.6
Manure: Ki	ind of	Tons	of Material	s in Wet Manure D	
Livesto	ck	Manure	Nitroge	n Phosphorus	Potash
Swine: Tab		210	3	1	1
Cattle: Ta		37866	212	38	189
Sheep: Tal		161	2	0	2
Horses: T		5112	35	5	31
Chickens:		352	5	1	1
Turkeys:		0	0	0	0
	Livestock,	43701	257	45	224
Fertilizer	91	Tons of		ertilizers Applie	d
		- 22		mary Nutrients	1 4 4
Ite	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	373	60	59	64

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan PLANNING SUBAREA: Northeast 2.4 COUNTY: Leelanau

9 634.2 100 1bs

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Used 100 lbs
Corn	2520	69.3	560	8.4		
Grains	972	4.8	324	3.2		
Hay or Grass Silage	1870	18.7	1559	15.5		
Pastured Cropland	1515	15.1	1515	15.1		
Other Field Crops	51	1.5	57	6.5	57	8.5
Vegetables	23	.9	21	.6	12	.6
Orchards				-		
Berries	8445	360.3	9833	584.9	9860	730.9
Nursery, Greenhouse						
Other Crops						

TABLE	2-MANURE	FROM	SWINE

Totals 15396 170.6 13869
Total Herbicides, Insecticides, Fungicides: 1

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1174	113	75	188
1969	1139	91	55	146
1972	1200	100	50	150

Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons\_

TABLE	2.	-MANURE	MOGE	CATTLE

	The second second	Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves			
1964	6775	2284	1491			
1969	5753	11,68	4285			
1972	6300	1600	4700			
Wet Manure Per Anima	Factor: Tons	13.14	6,45			
Wet Manure Tons, 197		21024	30315			
	Defecated: Tons, 1972					
Nutrients 1	n Wet Manure: Nitroge	n, tons 287				
	Potash,					

Year Item	Sheep & Lambs	Horses & Ponies
1964	71 26 25	
1969	26	275
1972	25	781
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	10	9981
Nutrients in Wet Manure: Nitrogen, Tons	1	69
Phosphorus, Tons	0	10
Potash, Tons	0	60

### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	46300		
1969	13748		
1972	11/1/00		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	597		
Nutrients in Wet Manure: Nitrogen, tons	9	Combined	
Phosphorus, tons	2		
Potash, tons	2	Section 1971	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	220180	Number I-V farms 328 Acres in I-V farms 59699
Acres in farms	7771:5	Cropland I-V farms 34959
Cropland in farms	h3747	Harvested cropland
Harvested cropland in f	arms 21170	I-V farms 21207

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	2369	349	36	385 145
GRAINS	1099	145	0	
Wheat	184	29	0	29
Oats	700	97	0	97
Barley	102	97	0	97 5 1h
Rye	113	321	0	
OTHER FIELD CROPS	172	28	0	28
Sovbeans	115	10	0	10
Potatoes	57	18	0.	18
Sugar beets				
Field beans				
HAY OR GRASS SILAGE	4385	118	0	118
PASTURED CROPLAND	5101	54	0	514
Cropland used for pasture	4125	20	0	20
Improved pasture	976	34	0	34
VEGETABLES, SWEET CORN, MELONS	219	71	0	72
ORCHARDS	12902	2684	282	2966
BERRIES	230	48	5	53
NURSERY & GREENHOUSE PRODUCTS	14	1	0	1
OTHER CROPS				
Total Fertilizer Used, Tons		3498	323	3821
Percent of Fertilizer Used		92	8	100

			APPLIED		
Item	Tons	-	Tonnage	Tonnage not	1177
Fertilizer Used on Crops: Solid	5136	Year	Government Cost/Shared	Government Cost/Shared	Total
Liquid	978	1972	1237	788	2025
Total	6171	Ton	mages for Oth	er Recent Yea	rs
Primary Nutrients in Fertilizer	2996		inger in a		-
Nitrogen	989				-
Phosphorus	959				
Potash	1048				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	718	6.1
1971-72	769	3.8
1972-73	716	5.7
	imated Tons Applied on All	Highways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides		ecticides	Fungicides	Total
Table 1	470.6	1 6	34.2	740.0	1844.8
Manure: Kind of		Tons	of Materials	s in Wet Manure I	
Livesto	ck	Manure	Nitroger	n Phosphorus	Potash
Swine: Tal	ole 2	1085	17	4	14
Cattle: Ta	able 3	51339	287	51	257
Sheep: Tal		40	1	0	0
Horses: T		9981	69	10	60
Chickens:		597	9	2	2
Turkeys:	Table 5	0	0	0	0
	Livestock,	63042	383	67	323
Fertilizer	8:	Tons of	Commercial Fe	ertilizers Applie	ed.
			Pri	mary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	61.114	989	959	1048

Limestone equivalent purchased or applied, to Table 8 2025

Salts: Applied on all highways, tons: Table 9 1039

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047

(1) County, land area, acres includes water areas under 40 acres in size.

Tonnage

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA:	Lake Michigan 2.0	STATE:	Michigan
DY AND THE CUPARPA	W -41 0 1	COTREES	Maratatasas

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	*	-	-	2		
Grains	1170	5.8	390	3.9		
Hay or Grass Silage	2005	20.0	1671	16.7		
Pastured Cropland	1.356	13.5	1356	13.5		
Other Field Crops	5	0.1	6	.6	6	.9
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse	180					
Other Crops						
Totals	1536	39.1	3/123	311.7	6	

TABLE 2--MANURE FROM SWINE

Hog & Pig		Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	79	16	2	18
1969	110	6	3	9
1972	110	6	3	9
Wet Manu	re Defecated:	ons per litter f Tons, 1972 re: Nitrogen, t	65	
		Phosphorus,		

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	3768	2000	1768		
1969	3550	1915	1635		
1972	3900	1200	2700		
Wet Manure F Per Animal	actor: Tons	13.14	6.45		
Wet Manure De Tons, 1972	efecated:	15768	17415		

Year Item	Sheep &	Horses & Ponies
1964	19	
1969	5	99
1972	5	1264
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	8	16154
Nutrients in Wet Manure: Nitrogen, Tons	0	277
Phosphorus, Tons	0	16
Potash Tons	0	97

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		91,75		
1969		6737		
1972		7500		
Wet Manure Factor:	Lbs. per bird	82.9		
wet Manure Defecated	: Tons, 1972	311		
Nutrients in Wet Man	ure: rogen, tons	5	Combined	
	sphorus, tons	1		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	s (1) 649216	Number I-V farms 72
Number of farms	98	Acres in I-V farms 2h71h
Acres in farms	28483	Cropland I-V farms 13714
Cropland in farms	16049	Harvested cropland
Harvested cropland in f	arms 9118	I-V farms 8076

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	158	721	0	211
GRAINS	2108	178	11	189
Wheat	81	3	0	3
Oats	1972	1.70	22	181
Barley	5	1	- 0	7
Rye				
OTHER FIELD CROPS	7	2	0	2
Soybeans				
Potatoes	6	2	0	2
Sugar beets				
Field beans	27	0	0	0
HAY OR GRASS SILAGE	5821	69	1.0	55
PASTURED CROPLAND	4877	69	0	69
Cropland used for pasture	4802	66	0	66
Improved pasture	75	3	0	3
VEGETABLES, SWEET CORN, MELONS				
ORCHARDS				
BERRIES				
NURSERY & GREENHOUSE PRODUCTS				
OTHER CROPS				
Total Fertilizer Used, Tons		308	21	329
Percent of Fertilizer Used		94	6	0

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

artonia y and an artonia			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	1412	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	814	1972	58	0	58
Total	526		names for Oth	er Recent Yea	rs
Primary Nutrients in Fertilizer	85	- AGI	nages for our	CI RECORE 300	-
Nitrogen	83			-	-
Phosphorus	90				
Potash	72				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2874	13.2
1971-72	2935	13.6
1972-73	31.96	13.9
Total Estin	mated Tons Applied on All H	ighways in 1972-73,

	Herbicides	Inse	cticides	Fungicides	Total
Table 1	39.4		34.7	.9	75.0
Manure: Kind of		Tons		in Wet Manure De	
Livesto	ck	Manure	Nitrogen	Phosphorus	Potash
Swine: Ta	ble 2	65	1	0	0
Cattle: Table 3		33183	186	33	166
Sheep: Table 4		8	0	0	0
Horses: Table 4		16154	111	16	97
Chickens: Table 5		311	5		1
Turkeys: Table 5		0			
	Livestock,	49721	303	50	264
Fertilizer	81	Tons of (		ertilizers Applied	
				mary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7		526 85		83	90
	estone equival le 8 58	ent purchas	ed or applie	ed, tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan PLANNING SUBAREA: Northeast 2.h \_\_ COUNTY: Manistee

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS	1972	

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 Ibs
Corn	1620	144.5	360	5.4		
Grains	810	4.0	270			
Hay or Grass Silage	1734	17.3	21/1/5	2.7		
Pastured Cropland	2385	23.8	2385	23.8		
Other Field Crops	1068	32.0	1187	136.5	1187	178.0
Vegetables	1619	45.2	992	73.1	1283	54.8
Orchards						233
Berries	4515	235.7	4958	394.9	5030	665.7
Nursery, Greenhouse						
Other Crops						
Totals	13751	402.5	71507	650.8	7500	898.5
Total Herbicides, In					32848	1951.

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sows Farrowing			
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
964	1120	110	152	262	
1969	936	70	49	119	
1972	1000	70	50	120	

Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons

## TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves					
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	<u>ш</u> 578	2124	2454				
1969	4850	2061	2789				
1972	5300	2200	3100				
Wet Manure   Per Anima	actor: Tons	13.14	6.45				
Wet Manure I	AND ADDRESS OF THE PARTY OF THE	28908	19995				

## TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1173	
1969	11.90	107
1972	1000	649
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1610	8294
Nutrients in Wet Manure: Nitrogen, Tons	23	57
Phosphorus, Tons	3	8
Potash, Tons	16	50

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Ite	m	Chickens	Turkey Hens	Turkeys
1964		33770		
1969		33770 34001		
1972		25200		
Wet Manure Factor: Lbs. p	er bird	82.9		
Wet Manure Defecated: Ton	8, 1972	1045		
Nutrients in Wet Manure: Nitrogen, tons		16	Combined	
Phosphoru	s, tons	4		
Potash, t	ons	4		

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	353920	Number I-V farms 196
Number of farms	376	Acres in I-V farms 48043
Acres in farms	68336	Cropland I-V farms 28902
Cropland in farms	39648	Harvested cropland
Harvested cropland in far	ms 179h9	I-V farms 14684

	Crop	Tons o	r Used	
Crops	Acres	Dry	Liquid	Total
CORN	1396	184	4	188
GRAINS	921	93	10	103
Wheat	197	25 43	5	30
Oats	548	143	2	145
Barley	14	2	0	2
Rye	162	23 688	3	26
OTHER FIELD CROPS	1269	688	412	1100
Soybeans				
Potatoes	1187	676	412	1088
Sugar beets				
Field beans				
HAY OR GRASS SILAGE	3523	49	0	149
PASTURED CROPLAND	6787	157	0	157
Cropland used for pasture	6383	157	0	157
Improved pasture	lioli	0	0	0
VEGETABLES, SWEET CORN, MELONS	13/12	343	28	371
ORCHARDS	5504	1084	10	1094
BERRIES	705	280 -	7	287
NURSERY & GREENHOUSE PRODUCTS	85	15	0	15
OTHER CROPS	11	2	0	2
Total Fertilizer Used, Tons		2895	171	3366
Percent of Fertilizer Used		86	111	100

# TABLE 7-- FERTILIZER USED IN 1972 TABLE 8-- CROUND LIMESTONE CONTVALENT

TABLE /PERITLIZER	USED IN 1972	TABLE	APPLIED	MESIONE EQUIV	VIPENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	4524	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	862	1972	1571	1390	2961
Total	5386				
Primary Nutrients in		lon	nages for Uth	er Recent Yea	TS
Fertilizer	2639				*
Nitrogen	872				
Phosphorus	844				
Potash	924				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1257	13.6
1971-72	1536	16.7
1972-73	1544	15.8
Total Estima	ted Tons Applied on All	Highways in 1972-73,

#### TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Insecticides		Fungicides	Total
Table 1	402.5	65	0.8	898.5	1951.8
Manure: Kin	d of	Tons o	f Materials	in Wet Manure De	fecated
Livestock		Manure	Nitrogen	Phosphorus	Potasi
Swine: Table	e 2	868	21,	3	3
Cattle: Tab	le 3	1,8903	274	149	245
Sheep: Table		1610	23	3	16
Horses: Tab.	le 4	8294	57	8	50
Chickens: T	able 5	1045	16	1 4	14
Turkeys: Ta	ble 5	0			1
Total from L. Tons	ivestock,	60720	384	67	318
Fertilizers:		Tons of Co		rtilizers Applied	
Item		Total	Nitrogen	Phosphorus	Potasi

Fertilizers:	Tons of	Commercial Fer	tilizers Applied		
		Primary Nutrients			
Item	Total	Nitrogen	Phosphorus	Potash	
Applied on Cropland: Table 7	5386	871	814	924	

Lime: Limestone equivalent purchased or applied, tons: Table 8

Salts: Applied on all highways, tons: Table 9 2240

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan PLANNING SUBAREA: Northeast 2.1 COUNTY: Mason

ALS USED ON CROPS, 1972 TABLE 6—CROP ACREAG

TARLE	1-ESTIMATED	AMOUNTS	OF	CHEMICALS	HSED	ON	CROPS	1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	9630	264.8	2140	32.1		
Grains	3816	19.0	1272	12.7		
Hay or Grass Silage	1387	13.8	3656	36.5		
Pastured Cropland	2271	22.7	2271	22.7		
Other Field Crops	20	.5	22	2.5	22	3.3
Vegetables	2248	50.9	1312	72.5	1790	90.9
Orchards					Livery	
Berries	3866	169.3	1681	342.0	4688	565.9
Nursery Greenhouse						
Other Crops						
Totals	26238	571.0	15357	521.0	6500	660.1
Total Herbicides, In					48095	1752.1

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	933	102	100	202
1969	806	148	58	106
1972	800	48	58	106

 Wet Manure Factor: Tons per litter farrowed
 7.23

 Wet Manure Defecated: Tons, 1972
 766

 Nutrients in Wet Manure: Nitrogen, tons
 1

 Phosphorus, tons
 1

 Potash, tons
 3

# TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	2h32h	6093	8231			
1969	11533	1,370	7163			
1972	12600	1800	7800			
Wet Manure H Per Animal	actor: Tons	13.14	6.45			
Wet Manure I Tons, 1972		63072	50310			
	Defecated: Tons, 1972 Wet Manure: Nitroge Phospho Potash,	n, tons 635 rus, tons 113				

Year Item	Sheep & Lambs	Horses & Ponies
1964	1083	
1969	1570	294
1972	1300	1111
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2093	11/199
Nutrients in Wet Manure: Nitrogen, Tons	29	98
Phosphorus, Tons	4	14
Potash, Tons	21	85

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	45938		
1969	31100		
1972	33200		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	1376		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	21	_	
Phosphorus, tons	6		
Potash, tons	5		dies.

TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	313408	Number I-V farms 19
Number of farms	608	Acres in I-V farms 7009h
Acres in farms	95818	Cropland I-V farms 19915
Cropland in farms	63655	Harvested cropland
Harvested cropland in far	ms 37963	I-V farms 32018

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	7222	2067	37	17.04
GRAINS	5314	573	2	575
Wheat	2384	276	1	277
Oats		279	1	280
Barley	41	5	0	3
Rye	253	7/1	0	114
OTHER FIELD CROPS	217	142	3	145
Soybeans	30	2	0	2
Potatoes	22	12	2	31/2
Sugar beets				
Field beans	348	0	0	0
HAY OR GRASS SILAGE	11030	140	3	11/3
PASTURED CROPLAND	6873	39	0	39
Cropland used for pasture	6494	36	0	36
Improved pasture	379	3	0	3
VEGETABLES, SWEET CORN, MELONS	1975	292	0	292
ORCHARDS	6057	889	64	953
BERRIES	127	69	1	70
NURSERY & GREENHOUSE PRODUCTS	23	14	0	14
OTHER CROPS	12	0	0	0
Total Fertilizer Used, Tons		3115	110	3225
Percent of Fertilizer Used		97	3	100

## TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

- Carrier		APPLIED					
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	143314	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	826	1972	1835	1274	3109		
Total	5160			er Recent Yea			
Primary Nutrients in Fertilizer	2528	101	nages for our	LET ME CEITE YOU			
Nitrogen	834				-		
Phosphorus	809						
Potash	885						

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

16.5
18.7
12.8
ays in 1972-73,

Table 1 Herbicide		secticides 521.0	Fungicides 660.1	Total 1752.1	
Manure: Kind of	Tons		in Wet Manure De	fecated	
Livestock Swine: Table 2	766	MICIOSER	THOSPHOLUS	2	
Cattle: Table 3	113382	635	113	567	
Sheep: Table 4	2093	29	14	21	
Horses: Table 4	11/199	98	14	85	
Chickens: Table 5	1376	21	6	5	
Turkeys: Table 5	0				
Total from Livestock, Tons	131816	787	138	681	
Fertilizers:	Tons of	Commercial Fer	tilizers Applied	1	
		Prima	ry Nutrients		
Item	Total	Nitrogen	Phosphorus	Potash	
Applied on Cropland: Table 7	5160	834	809	885	

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To

Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 907.2

Salts: Applied on all highways, tons: Table 9 1122

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
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PLANNING AREA: Lake Michigan 2.0 STATE: Michigan PLANNING SUBAREA: Northeast 2.4 COUNTY: Mecosta

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	20520	564.3	4560	68.4		
Grains	1,674	23.0	1538	15.3		
Hay or Grass Silage	6211	62.1	5176	51.7		
Pastured Cropland	5758	57.5	5758	57.5		
Other Field Crops	1691	128.7	2698	297.0	2573	385.9
Vegetables	2281	64.0	1267	74.8	1766	95.1
Orchards					100	1 - N
Berries	62	3.0	70	8.2	70	22.4
Nursery, Greenhouse						
Other Crops						
Totals	MILLO	902.6	21067	572.9	1409	503.4
Total Herbicides, In	secticide	s, Fungic	ides: 10	0 1bs	69616	1978.9

TARLE 2 MANUEL PROM SUTNE

Hog & Pig		Number So		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	70tal 973 638
1964	39110	512	461	
1969	3940 2674	342	296	638
1972	2800	400	300	700

Wet Manure Factor: Tons per litter farrowed\_ Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons\_ Potash, tons\_

		Number Catt	le and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	21783	8959	12824
1969	18414	7334	11080
1972	20100	8000	12100
Wet Manure Per Anima	Factor: Tons	13.14	6.45
Wet Manure Tons, 197		105120	78045
		trogen, tons 10	33165 326 33 16

Year	Item	Sheep & Lambs	Horses & Ponies
1964		1058	
1969		1278	1464
1972		1000	1674
Wet Manure Facto	r: Tons per animal	1.61	12.78
Wet Manure Defec	ated: Tons, 1972	1610	21394
Nutrients in Wet	Manure: Nitrogen, Tons	23	11/18
	Phosphorus, Tons	3	21
	Potash, Tons	16	128

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	50858		
1969	39785		
1972	43900		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	1820		
Nutrients in Wet Manure: Nitrogen, tons	28	Combined	
Phosphorus, tons	7		
Potash, tons	6		-

TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1	358400	Number I-V farms	407
Number of farms	792	Acres in I-V farms	107674
Acres in farms	150700	Cropland I-V farms	72108
Cropland in farms	95322	Harvested cropland	
Harvested cropland in farm	s 50136	I-V farms	42461

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota.
CORN	12958	1526	400	1926
GRAINS	6430	564	6	570
Wheat	2018	201	2	203
Oats	3090	315	3	318
Barley	66	9	0	9
Rye	1176	34	1	35
OTHER FIELD CROPS	4739	1708	266	1974
Soybeans	30	0	0	0
Potatoes	2573	11/43	260	1703
Sugar beets				
Field beans	482	0	0	0
HAY OR GRASS SILAGE	15507	166	3	169
PASTURED CROPLAND	16120	177	0	177
Cropland used for pasture	15140	169	0	169
Improved pasture	680	8	0	8
VEGETABLES, SWEET CORN, MELONS	1998	352	6	358
ORCHARDS	1,81,	61	0	61
BERRIES	11	2	0	2
NURSERY & GREENHOUSE PRODUCTS				
OTHER CROPS	5	3	0	3
Total Fertilizer Used, Tons		4559	681	5240
Percent of Fertilizer Used		87	13	100

IVALENT

TABLE 7FERTILIZER	USED IN 197	72 TABLE		MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	7043	Year	Government Cost/Shared	Government	Total Tonnage
Liquid	13/11	1972	5695	100	5795
Total	8384	Ton	pages for Oth	er Recent Yea	rs
Primary Nutrients in Fertilizer	4108	100	mugeo ava ser		-
Nitrogen	1356				
Phosphorus	1315				
Potash	1437				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1633	18.9
1971-72	1522	17.7
1972-73	2090	22.8
Total Estima	ted Tons Applied on All Hi	ghways in 1972-73,

Table 1	Herbicides 902.6	Inse	572.9	Fungicides 503.4	Total 1978.9
Manure: Ki		Tons	of Materials	in Wet Manure D	
Livesto	:k	Manure	Nitrogen	Phosphorus	Potash
Swine: Tab	le 2	5061	79	20	1.8
Cattle: Ta	ble 3	183165	1026	183	916
Sheep: Tab	le 4	7670	23	3	16
Horses: Ta	able 4	27394	11/8	21	128
Chickens:	Table 5	1820	28	7	6
Turkeys:	able 5	0			
Total from Tor	All bearings and the second of	213050	1232	234	1084
Fertilizers	:	Tons of	Commercial Fe	rtilizers Applie	d
			Prin	ary Nutrients	
Ite	em	Total	Nitrogen	Phosphorus	Potast
Applied on Table 7	Cropland:	8384	1356	1315	1437

Lime: Limestone equivalent purchased or applied, tons:

Table 8 5795 Salts: Applied on all highways, tons: Table 9 3032

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

(1) County, land area, acres includes water areas under 40 acres in size.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA:	Lake Michigan 2.0	STATE:	Michigan	
DI ANNING CITRADEA.	Nawthaget 2 l	COINTY+	Mieroukoo	

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS,	1972	
parameter and		-	_		-100	7. 77.11		2000	ň

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	81,60	232.6	1880	28.2		
Grains	3612	78.0	1204	12.0		
Hay or Grass Silage	6621	66.2	5518	55.1		
Pastured Cropland	hanh	10.7	hanh	10.1		
Other Field Crops	284	8.5	31.6	36.3	316	47.4
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	23091	366.L	13032	172.7	316	47.4

TABLE 2--MANURE FROM SWINE

TARLE 3 .- MANUER FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves		
1964	16695	7117	9578		
1969	17121	7014	10107		
1972	18700	7600	11100		
Wet Manure Per Anima	Factor: Tons	13.14	6,45		
Wet Manure Tons, 197		99864	71595		
	Defecated: Tons, 1972 n Wet Manure: Nitroge		9		
		rus, tons 171			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	4560	
1969	1907	239
1972	1600	1039
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2576	13278
Nutrients in Wet Manure: Nitrogen, Tons	36	92
Phosphorus, Tons	5	13
Potash, Tons	26	80

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year It	em	Chickens	Turkey Hens	Turkeys Raised
1964		58598		
1969		69438	The state of the s	
1972		56700		
Wet Manure Factor: Lbs.	per bird	82.9		
wet Manure Defecated: To	ns, 1972	2350		
Nutrients in Wet Manure: Nitrogen		37	Combined	
	us, tons	0		
Potash,		В		H .

TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	s (1) 361280	Number I-V farms 307
Number of farms	hh?	Acres in I-V farms 79632
Acres in farms	97790	Cropland I-V farms 52245
Cropland in farms	61721	Harvested cropland
Harvested cropland in f	arms 36370	I-V farms 32550

	Crop	Tons o	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total		
CORN	6960	1028	78	1106		
GRAINS	5733	673	2	675		
Wheat	976	108	0 2	108 546		
Oats	4525	544	2	546		
Barley	7/4	7	0	7		
Rye	148	13	0	13		
OTHER FIELD CROPS	333	123	20	143		
Soybeans						
Potatoes	316	122	20	142		
Sugar beets						
Field beans	480	0	0	0		
HAY OR GRASS SILAGE	19051	260	0	260		
PASTURED CROPLAND	15446	139	0	139		
Cropland used for pasture	13740	122	0	122		
Improved pasture	1706	17	0	17		
VEGETABLES, SWEET CORN, MELONS	104	20	1	21		
ORCHARDS	2	0	0	0		
BERRIES	12	2	1	3		
NURSERY & GREENHOUSE PRODUCTS	1	1	0	1		
OTHER CROPS	60	0	0	0		
Total Fertilizer Used, Tons		22/16	102	23/18		
Percent of Fertilizer Used		96	14	100		

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

Item	Tons
Fertilizer Used on Crops: Solid Liquid	3156 601
Total	3757
Primary Nutrients in Fertilizer	1841
Nitrogen	608
Phosphorus	589
Potash	6lili

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total
1972	5257	125	5382
Ton	nages for Oth	er Recent Yea	rs
		-	-

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1136	15.5
1971-72	1013	13.9
1072-73	1167	15.0
Total Estima As Comput	ted Tons Applied on All Hi	ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	ecticides	Fungicides	Total
Table 1 366.4		172.7		47.4	586.5
Manure: Kind of Livestock		Tons	of Materia	ls in Wet Manure D	
		Manure	Nitrog	en Phosphorus	Potash
Swine: Table 2		14338	68	17	15
Cattle: Table 3		173159	960	171	857
Sheep: Table 4		2575	36	5	26
Horses: Table 4		13278	92	13	80
Chickens: Table 5		2350	37	9	8
Turkeys: Table 5		0			
Total from Livestock, Tons		190001	1193	215	986
Fertilizer	9:	Tons of		Pertilizers Applie	d
-				imary Nutrients	1
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7		3757	608	589	644

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 1692

Agricultural C	hemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
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PLANNING AREA: Take Michigan 2.0 STATE: Michigan PLANNING SUBAREA: Northeast 2.4 COUNTY: Muskegon

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	10620	292.0	2360	35.4		
Grains	2064	10.3	688	6.8		
Hay or Grass Silage	3363	33.6	2802	28.0		
Pastured Cropland	1557	15.5	1557	15.5		
Other Field Crops	4-08-0			-282		
Vegetables	2682	168.8	1792	81.8	1556	135.5
Orchards		200		04,80	2000	20101
Berries	1656	74.6	1941	162.6	1942	341.5
Nursery, Greenhouse		1942		200.10	de y hope	244.00
Other Crops						
Totals	21942	594.8	סענננ	330.1	3498	1:77.0
Total Herbicides, In	secticide	s. Fungic	ides: 10	0 lbs	36580	1401.9

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	3917	202	2111	1416
1969	2127	222	187	1109
1972	2200	300	200	500

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Mitrogen, tons
Phosphorus, tons
Potash, tons

TABLE 3-MANURE FROM CAT

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	12971	5327	76hh			
1969	9719	J <sub>1</sub> 71/ <sub>12</sub>	5577			
1972	1,0600	1,500	6100			
Wet Manure Per Anima	Factor: Tons	13.1h	6,45			
Wet Manure   Tons, 197	The state of the s	59130	39345			
Wet Manure   Nutrients in	Defecated: Tons, 1972 n Wet Manure: Nitroge	Combined: 98475				
		rus, tons 98	The state of the s			

Year Item		eep & Horses & Ponies
1964	317	
1969	176	
1972	100	
Wet Manure Factor: Tons per an		
Wet Manure Defecated: Tons, 19	72 161	
Nutrients in Wet Manure: Nitro	gen, Tons 2	251
	horus, Tons 0	36
	h, Tons 2	279

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys
1964		L8377		10000
1969		70166		
1972		144400		
Wet Manure Fact	or: Lbs. per bird	82.9		
Wet Manure Defe	cated: Tons, 1972	1840		
Nutrients in We	t Manure: Nitrogen, tons	29	Combined	
Nitrogen, tons Phosphorus, ton Potash, tons	Phosphorus, tons Potash, tons	7		

TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1	320896	Number I-V farms	299
Number of farms	578	Acres in I-V farms	50661
Acres in farms	71580	Cropland I-V farms	31,966
Cropland in farms	141672	Harvested cropland	
Harvested cropland in farms	30749	I-V farms	26002

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	7677	1119	167	1286
GRAINS	4128		0	1449
Wheat	1518	1419	0	148
Oats		228	0	228
Barley	1974 54	111	0	111
Rye	199	17	0	17
OTHER FIELD CROPS	1/16	106	0	106
Soybeans		100.00	- X	
Potatoes			100000	
Sugar beets				
Field beans	162	0	0	0
HAY OR GRASS SILAGE	8224	230	17	247
PASTURED CROPLAND	3863	111	0	711
Cropland used for pasture	3586	11	0	11
Improved pasture	277	3	0	3
VEGETABLES, SWEET CORN, MELONS	2691	941	2	943
ORCHARDS	2091	201	1	202
BERRIES	628	93	Ö	93
NURSERY & GREENHOUSE PRODUCTS	62	6	0	6
OTHER CROPS	84	1 1	0	1
Total Fertilizer Used, Tons		3160	187	3347
Percent of Fertilizer Used		94	6	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT APPLIED

Item	Tons		Townson	m	
Fertilizer Used on Crops: Solid	141.98 857	Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
Total Liquid	5355	1972	3083	1,11,	3497
Primary Nutrients in Fertilizer	2624	Ton	nages for Oth	er Recent Yea	rs -
Nitrogen	866				
Phosphorus	840		1		
Potash	918				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1,231	21,3
1971-72	5057	28.2
1972-73	1776	25.5
Total Estin	mated Tons Applied on All H uted 6927	ighways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	s Ins	ecticides	Fungicides	Total
Table 1	594.8		330.1	477.0	1401.9
Manure: K		Tons	of Material	s in Wet Manure D	efecated
Livesto		Manure	Nitroge	n Phosphorus	Potash
Swine: Tal	ole 2	3615	56	11/	13
Cattle: T		98475	551	98	1192
Sheep: Table 4		161	2	0	2
Horses: Table 4		36436	251	36	219
Chickens: Table 5		1810	29	7	6
Turkeys:		0			
Total from Ton	Livestock,	140527	889	155	732
Fertilizer	3:	Tons of	Commercial F	ertilizers Applie	d
			Pri	mary Nutrients	
Ite		Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	5355	866	840	918

Table 8 3497

Salts: Applied on all highways, tons: Table 9 6927

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

STATE: Michigan

PLANNING SUBAREA: Northeast 2.4

COUNTY: Newaygo

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	18810	517.2	4180	62.7		
Grains	31/1/1	17.2	17/18	11.4		
Hay or Grass Silage	7696	76.9	6111	64.7		
Pastured Cropland	1,720	47.2	1,720	47.2		
Other Field Crops	155	4.6	172	19.7	172	25.8
Vegetables	1273	267.1	1,062	304.2	3178	301.7
Orchards	24					
Berries	1569	73.4	1887	182.7	1887	129.7
Nursery, Greenhouse						
Other Crops						
Totals	1,0667	1003.6	22583	692.0	5237	757.2

TABLE	2-MANURE	FROM	SWINE	

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	3618	31/1	386	730
1969	14566	332	368	700
1972	1,700	400	400	800

1972	11700	400	400	800
Wet Manur	e Factor: Tons	per litter far	rowed	7.23
	e Defecated: Tor			578Li
Nutrients	in Wet Manure:	Nitrogen, tor	15	9
		Phosphorus,	ons	
		Potash, tons		22

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves		
1964	22616	10378	12238		
1969	20667	9748	10919		
1972	22600	1,0600	12000		
Wet Manure Per Anima	Factor: Tons	13.11	6.45		
Wet Manure Tons, 197		139284	77400		
	Defecated: Tons, 1972 n Wet Manure: Nitroge Phospho Potash,	n, tons 1213 rus, tons 217			

TABLE A .- MANUTER FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1750	
1969	1502	807
1972	1200	2497
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1932	31912
Nutrients in Wet Manure: Nitrogen, Tons	27	220
Phosphorus, Tons	4	32
Potash, Tons	19	191

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		111765		
1969		70/1303		
1972		86700		
Wet Manure Fact	or: Lbs. per bird	82.9		
Wet Manure Defe	cated: Tons, 1972	3594		
Nutrients in We	Manure: Nitrogen, tons	56	Combined	
	Phosphorus, tons	14		
	Potash, tons	13		192

#### TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	s (1) 51,3552	Number I-V farms 517	
Number of farms	1012	Acres in I-V farms 104130	
Acres in farms	151125	Cropland I-V farms 71285	
Cropland in farms	98100	Harvested cropland	
Harvested cropland in f	arms 55948	I-V farms 46810	

	Crop	Tons o	s of Fertilizer Used		
Crops	Acres	Dry	Liquid	Total	
CORN	13867	11,75	164	1639	
GRAINS	5365	565	3	568	
Wheat	1864	180	2	1.82	
Oats	2839	325	1	326	
Barley	73	10	- 0	10	
Rye	197	13	0	13	
OTHER FIELD CROPS	965	195	0	195	
Soybeans					
Potatoes	172	58	0	58	
Sugar beets					
Field beans	110	0	0.	0	
HAY OR GRASS SILAGE	19853	323 181	1	327 181	
PASTURED CROPLAND	1.6824		0		
Cropland used for pasture	12/1/11	174	0	174	
Improved pasture	1,383	7	0	7	
VEGETABLES, SWEET CORN, MELONS	1,691	1805	2	1807	
ORCHARDS	2372	178	0	178	
BERRIES	52	3	0	3	
NURSERY & GREENHOUSE PRODUCTS	18	1	0	1	
OTHER CROPS	0	0	0	0	
Total Fertilizer Used, Tons		4726	173	1,899	
Percent of Fertilizer Used		94	6	100	

TABLE 7FERTILIZER U	JSED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	6585	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1254	1972	6002	560	6562
Total	7839		mages for Orb	er Recent Yes	
Primary Nutrients in Fertilizer	3841	102	magos rox occ		-
Nitrogen	1268				-
Phosphorus	1229				
Potash	13111				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	3739	28.4
1971-72	3828	29.5
1972-73	3549	25.5
Total Estima As Comput	ted Tons Applied on All H	Ighways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	The second second second				-
	Herbicide		secticides	Fungicides	Total
Table 1	1003.6	- (	92.0	757.2	2452.8
Manure: Ki	nd of	Ton	s of Material	s in Wet Manure D	efecated
Livesto	k	Manur	e Nitroge	n Phosphorus	Potash
Swine: Tab		578L	90	23	20
Cattle: Ts		216684	1213	217	1.083
Sheep: Tab		1932	27	1	19
Horses: Ta		31912	220	32	191
Chickens:	Table 5	3594	56	14	13
Turkeys: 7	able 5	0	100		
Total from Tor		251,906	1606	290	1326
Fertilizers	1	Tons of	Commercial F	ertilizers Applie	d
			Pri	mary Nutrients	
Ite	:un	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	7839	1268	1229	1344

Lime:	Limestone	equivalent	purchased	OI	applied,	tons:
	Table 8	6562				

Salts: Applied on all highways, tons: Table 9 51168

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: Michigan PLANNING AREA: Take Michigan 2.0

PLANNING SUBAREA: Northeast 2.4

COUNTY: Oceana

Crop Group or Crops	Herbi	cides	Insecticides		Fungicides	
	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	10080	277.2	2240	33.6		
Grains	1668	8.3	556	5.5		
Hay or Grass Silage	4123	41.2	3436	34.3		
Pastured Cropland	2970	29.6	2970	29.6		
Other Field Crops	58	1.7	65	7.4	65	9.7
Vegetables	5688	230.4	1607	158.6	3085	167.1
Orchards						
Berries	12801	5/12.8	15586	1068.6	15587	1667.3
Nursery, Greenhouse						
Other Crops						

TABLE	2MANURE	FROM	SWINE

	Hog & Pig	Number Sows Farrowing		Number Sows Farrowing		
Year	Inventory	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total		
1964	3170	268	311	579		
1969	1995	202	179	381		
1972	2100	300	200	500		

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves		
1964	11,529	5898	8631		
1969	12269	1695	7574		
1972	13400	5100	8300		
Wet Manure   Per Anima	Factor: Tons	13.14	6.45		
Wet Manure I		67014	53535		

#### TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	201	
1969	676	401
1972	600	1548
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	966	19783
Nutrients in Wet Manure: Nitrogen, Tons	111	137
Phosphorus, Tons	2	20
Potash, Tons	10	119

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	61272		
1969	83448		
1972	92500		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	3834		
Nutrients in Wet Manure:		Combined	-
Nitrogen, tons	60	- CONTRACTOR OF CO	
Phosphorus, tons	15		
Potash, tons	13		-

#### TABLE 6--- CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1	343232	Number I-V farms	547
Number of farms	864	Acres in I-V farms	106537
Acres in farms	131419	Cropland I-V farms	68229
Cropland in farms	80266	Harvested cropland	
Harvested cropland in farms	50407	I-V farms	45796

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	8446	11/56	37	1493
GRAINS	3790	411	0	411
Wheat	1784	201	0	201
Oats	1110	1/12	0	1775
Barley	46	14	0	14
Rye	780	60	0	60
OTHER FIELD CROPS	86	29	0	29
Soybeans				
Potatoes	65	27	0	27
Sugar beets				
Field beans	174	1	0	1
HAY OR GRASS SILAGE	11130	223	0	223
PASTURED CROPLAND	9894	99	0	99
Cropland used for pasture	9302	.93	0	93
Improved pasture	592	6	0	6
VEGETABLES, SWEET CORN, MELONS	1070	1167	53	1220
ORCHARDS	18130	2986	28	301/1
BERRIES	53	8 .	0	8
NURSERY & GREENHOUSE PRODUCTS	108	33	2	35
OTHER CROPS	50	8	0	8
Total Fertilizer Used, Tons		6421	120	6541
Percent of Fertilizer Used		98	2	100

# TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

TADDO / TOKT INTERN	0000 IN 157		APPLIED	- Inches	
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	8792	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1674	1972	w.e.w.	739)	12999
Total	1.0466		5605	er Recent Yes	
Primary Nutrients in Fertilizer	5128	100	nages for Oth	er Recent tea	-
Nitrogen	1.692				
Phosphorus	1641				
Potash	1795				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile	
1970-71	6lili	9.8	
1971-72	837	12.9	
1972-73	863	12.5	
Total Estim	ated Tons Applied on All H	ighways in 1972-73,	

# TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	ecticides	Fungicides	Total	
Table 1	1131.2	13	337.6	1844.1	4312.9	
Manure: K	ind of	Tons	of Material	Is in Wet Manure I	efecated	
Livesto	ck	Manure	Nitroge	en Phosphorus	Potash	
Swine: Tal	ole 2	3615	56	14	11	
Cattle: Ta	able 3	120549	675	121	603	
Sheep: Tal	ole 4	966	14	2	10	
Horses: Ta	able 4	19783	137	20	119	
Chickens:	Table 5	3834	60	15	13	
Turkeys:	Table 5	0				
Total from Tor	Livestock,	148747	942	172	756	
Fertilizer	9.7	Tons of	Commercial 1	Fertilizers Applie	d	
			Pri	imary Nutrients		
Ite	em	Total	Nitrogen	Phosphorus	Potash	
Applied on Table 7	Cropland:	10466	1692	1641	1795	

Limestone equivalent purchased or applied, tons: Table 8 12999

1253 Salts: Applied on all highways, tons: Table 9

To Convert From

Kilograms (kg)

Multiply By 0.453

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING	AREA:	Take Michigan 2.0	STATE:	Michigan
PLANNING	SUBAREA:	Northeast 2.h	COUNTY:	Osceola

TANK I DOWNATED AMOINTS OF CHEMICALS HEED ON CHORS 1072

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs		Amount Used 100 lbs
Corn	8190	225.2	1820	27.3		
Grains	3726	18.6	1242	12.4		
Hay or Grass Silage	7925	79.2	6604	66.0		
Pastured Cropland	6654	66.5	6654	66.5		
Other Field Crops	274	7.4	221	24.8	216	32.4
Vegetables	12000					
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
			- (-1)		22.6	20.1
Totals Total Herbicides, In	26769		1651/1	197.0	216 h3526	626.3

	2MANURE	
TABLE		

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	1380	160	140	300
1969	1074	161	130	291
1972	1100	200	100	300

Wet Manure Factor: Tons per litter farrowed\_ Wet Manure Defecated: Tons, 1972\_ Nutrients in Wet Manure: Nitrogen, tons\_ Phosphorus, tons\_ Potash, tons\_

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	25040	10588	11/1/52		
1969	19889	9165	10724		
1972	21800	10000	11800		
Wet Manure Per Anima	Factor: Tons	13.14	6.45		
Wet Manure Tons, 197	Defecated:	131400	76110		
	Defecated: Tons, 1972 in Wet Manure: Nitrog				

TABLE	4MANURE	FROM	SHEEP	AND	HORSES	

Year Item		Sheep & Lambs	Horses & Ponies
1964		3525	
1969		3188	1161
1972		2600	1697
Wet Manure Factor: Tons per ani	mal	1.61	12.78
Wet Manure Defecated: Tons, 197		1,186	21688
Nutrients in Wet Manure: Nitros	gen, Tons	59	150
Phosph	orus, Tons	9	22
Potash	, Tons	112	130

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Ite	m	Chickens	Turkey Hens	Turkeys Raised
1964		24305		
1969		20/182		
1972		22300		
Wet Manure Factor: Lbs. p	er bird	82.9		
Wet Manure Defecated: Ton	8, 1972	924		
Nutrients in Wet Manure:			Combined	
Nitrogen,	tons	7/1		
Phosphoru	s, tons	4		
Potash, t	ons	3	100 mg	( and )

TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	s (1) 3738hi0	Number I-V farms	360
Number of farms	663	Acres in I-V farms	
Acres in farms	135652	Cropland I-V farms_	59720
Cropland in farms	80h5h	Harvested cropland	
Harvested cropland in i	arms 30/156	I-V farms	32390

	Crop	Tons o	of Fertilize	T Used
Crops	Acres	Dry	Liquid	Tota
CORN	6315	804	100	904
GRAINS	5246	515	30	545
Wheat	1164	126	9	135 -
Oats	3871	375	18	393
Barley	hl	5	0	0 5
Rye	67	5	0	
OTHER FIELD CROPS	299	100	3	103
Soybeans	83	0	0	0
Potatoes	216	100	3 1	103
Sugar beets				
Field beans	136	1	0	1
HAY OR GRASS SILAGE	20616	232	8	240
PASTURED CROPLAND	19942	58	5	63
Cropland used for pasture	18976	56	4	60
Improved pasture	966	2	1	3
VEGETABLES, SWEET CORN, MELONS				
ORCHARDS	22	20	0	50
BERRIES	36	0	0	0
NURSERY & GREENHOUSE PRODUCTS	12		0	1
OTHER CROPS	62	31	0	31
Total Fertilizer Used, Tons		1762	146	1908
Percent of Fertilizer Used		92	8	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

LADOU / LINE LINE C			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	2565	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	488	1972	5063	300	5363
Total	3053		mages for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	1496	101	mages for our	LOT MC COMP PAR	-
Nitrogen	494				-
Phosphorus	479				
Potash	523				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2615	22.0
1971-72	2730	23.1
1972-73	2530 ited Tons Applied on All Hi	20.1

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	s Ins	secticides	Fungicides	Total
Table 1	369.9		197.0	32,4	626.3
Manure: Ki	nd of	Tons	of Material	of Materials in Wet Manure Defe	
Livestock		Manure	Nitroge	en Phosphorus	Potash
Swine: Tab		21.69	34	9	8
Cattle: Ta		207510	1162	208	1038
Sheep: Tab		4186	59	9	142
Horses: Table 4		21688	59 150	22	130
Chickens: Table 5		924	111	4	3
Turkeys: Table 5		0			
Total from Livestock, Tons		236477	1419	252	1221
Fertilizers		Tons of	Commercial 1	Fertilizers Appli	ed
101000000000000000000000000000000000000			Pri	imary Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	3053	494	479	523
	stone equiva		ased or appl	ied, tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA:	Lake Michigan 2.0	STATE:	Michigan
PLANNING SUBAREAT_	Northeast 2.4	COUNTY:	Roscommon

						i
TABLE 1-ESTIMA	TED AMOUNTS O	OF CHEMICALS	USED ON	CROPS,	1972	

	Herbi	cides	Insect	icides	Fungi	cides
Grop Group or Grops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1b
Corn Grains Hay or Grass Silage Fastured Cropland Other Field Crops Vegetables Orchards Berries Mursery, Greenhouse Other Crops	60 209 316	.3 h.0 3.1	20 3h1 316	- 2 3.li 3.l.		
Totala Total Herbicides, In	785 megticide	7.li	677 idea: 10	6.7 0 1bs	11:62	11.1

TABLE	2 MANURE	EROM	SWYME

Year	Hog & Pig Inventory Dec. 1	Dec. 1=May 31 Spring	June 1-Nov. 30	Total
		MEANING	10.1.1	AUCHA
1984	84	3	9	12
1969	58	- 5	3	8
1973	50.	h	)	A

Phosphorus, tons Potash, tons

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves			
1964 1969 1972	303 \$20	372	335			
1969		229	321			
7805	500	200	300			
Net Namure F Per Antual	actor: Tona	13.14	6,45			
Wet Manure D Yous, 1973		2628	1935			
Not Number D Nutrients in	efecated: Toma, 1972 Wet Manure: Nitroge Phosphi Potsab.	en, tons 26				

TABLE 4-MANURE FROM SHEEP AND BORSES

Year Item	Sheep & Lambs	Horses & Fonies
1363	368	
1969	228	358
1,972	108 118 100	255 106
Wat Manuse Factor: Your per animal	1,61	12,78
Well Sumure Desecated: Tons, 1972	161	5289
Nuccionda in Wet Manuse: Nicrogen, Tons	2	36
Phosphorus, Tons	0	8
Rotaan, Tona	3	33

TABLE 5-MANURE FROM CHACKENS & TURKSYS

Year	Inem	Ohd okean	Turkey Sees	Turkeys Rateed
1,364		437		
1,960		1,053		
1972		73500		
West Manuale Page	on: 4bs. per bind	\$2.9		
MEN MENTION DESIGNATION	canada Tona, 1972	46		
Sutvicence in Vie	t Manuales		COMPANSO.	
	Mittogen, tone	-3		
	Phosphonus, toos	0		
	Potnah, tona	0		-

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

Number of farms         L9         Acres in I-V farms         6703           Acres in farms         9035         Cropland I-V farms         2075           Cropland in farms         3328         Harvested cropland           Harvested cropland in farms         1693         I-V farms         892	COUNTY, land area, acre	3331110		er I-V farms	20
Cropland in farms 3328 Harvested cropland	Number of farms	119	Acre	es in I-V farms	6703
	Acres in farms	9035	Crop	land I-V farms	2075
Harvested cropland in farms 1693 I-V farms 892	Cropland in farms	3328	Harv	rested cropland	
	Harvested cropland in i	farms 1693		I-V farms_	892
			Crop	Tons of Fert	ilizer Used

	Crop	Tons o	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	Tota	
CORN	208	15	0	15	
GRAINS	76	0	0	0	
Wheat	124	7/4	0	14	
Oats		-		200	
Barley					
Rye				100	
OTHER FIELD CROPS			and the second		
Soybeans					
Potatoes		- 11			
Sugar beets					
Field beans	7	0	0	0	
HAY OR GRASS SILAGE	617	2	0	2	
PASTURED CROPLAND	1008	0	0	0	
Cropland used for pasture	948	0	0	0	
Improved pasture	60	0	0	0	
VEGETABLES, SWEET CORN, MELONS					
ORCHARDS	40	2	0	2	
BERRIES		1			
NURSERY & GREENHOUSE PRODUCTS	23	1	0	1	
OTHER CROPS	6	1	0	1	
Total Fertilizer Used, Tons		21	0	21	
Percent of Fertilizer Used		100	0	100	

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

	II HAND TO THE		APPLIED		
Item	Tons	4	Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	29	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	5	1972	153	0	153
Total	3/1			U	
Primary Nutrients in	-	Ton	mages for Oth	er Recent Yea	rs
Fertilizer	17				*
Nitrogen	5				
Phosphorus	5				
Porash	79.				

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	3195	19.7
1971-72	2663	11,3
1972-73	21/12	10.5
	sted Tons Applied on All E ted 3500	lighways in 1972-73,

# TABLE 10-SUMMARY OF ACRICULTURAL MATERIALS AND RIGHWAY DE-ICING

Table 1 7.4	Total Inc.	cticides	Fungicides	Total
Manure: Kind of				
Livestock	Manure		in Wet Manure De	Potash
Swine: Table 2	58	WittoRes	Edosphorus	rocasi
Cattle: Table 3	4563	26	- 2	23
Sheep: Table 4		3	0	2
Sorses: Table 4	161	36		31
Chickens: Table S	46	1	0	0
Turkeys: Table 5	0			
Tona	10017	66	10	56
Rertilizers:	Tons of O	ommercial Re	rtilizers Applied	
	-		ary Nutrients	
Item	Total	Nitrogen		Potasi
Applied on Cropland: Table 7	35	4	- 45	7

То Сонувать Втоль The. Multiply By

Rounds (15) Agres (agre) Toss (tos)

Kilograms (kg) Suctare (ba) Kilograma (kg)

0,453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING	AREA:	Lake Michigan 2.0	STATE:	Michigan
PLANNING	SUBAREA:	Northeast 2.4	COUNTY:	Schoolcraft

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs		Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn		-		-		
Grains	2110	1.2	80	.8		
Hay or Grass Silage	938	9.3	782	7.8		
Pastured Cropland	675	6.7	675	6.7		
Other Field Crops	7	.2	8	.9	8	1.2
Vegetables						
Orchards		-				
Berries						
Nursery, Greenhouse						
Other Crops						

Totals 1860 17.4 1505 Total Herbicides, Insecticides, Fungicides:

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	61	17	23	40
1969	53	33	14	47
1972	50	30	15	45

1545

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons

MADE O MANUEL PROM CAMPER

		Number Cattle	ber Cattle and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves		
1964	1909	909	1000		
1969	2108	1016	1092		
1972	2300	1100	1200		
Wet Manure F Per Animal	actor: Tons	13.14	6.45		
Wet Manure I Tons, 1972		11/1/51	77140		
	efecated: Tons, 1972 Wet Manure: Nitroge				
MULTIENTS IN		en, tons 12h			
	Potash.				

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	0	
1969	25	52
1972	25 25	205
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	40	2620
Nutrients in Wet Manure: Nitrogen, Tons	1	18
Phosphorus, Tons	0	3
Potash, Tons	0	16

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		7680		
1969		271		
1972		11.00		
Wet Manure Fa	ctor: Lbs. per bird	82.9		
wet Manure De	fecated: Tonn. 1972	46		
Nutrients in	Wet Manure:	SECTION STATE	Combined	
	Nitrogen, tons	1	_	
	Phosphorus, tons	.0	-	
	Potash, tons		X	-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	756032	Number I-V farms	26
Number of farms	54	Acres in I-V farms	10868
Acres in farms	14835	Cropland I-V farms	5323
Cropland in farms	6983	Harvested cropland	
Harvested cropland in farms	3804	I-V farms	2928

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	62	9	0	9
GRAINS	1426	53	0	53
Wheat	9	3	0	3
Oats	417	50	0	50
Barley			13-1	
Rye				
OTHER FIELD CROPS	8	14	0	4
Soybeans				
Potatoes	8	14	0	14
Sugar beets				
Field beans	32	0	0	0
HAY OR GRASS SILAGE	2437	42	0	142
PASTURED CROPLAND	2061	49	0	49
Cropland used for pasture	2011	49	0	49
Improved pasture	50	0	0	0
VEGETABLES, SWEET CORN, MELONS				
ORCHARDS				
BERRIES				
NURSERY & GREENHOUSE PRODUCTS				
OTHER CROPS				
Total Fertilizer Used, Tons		157	0	157
Percent of Fertilizer Used		1.00	0	1.00

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	211	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	40	1972	107	25	172
Total	251		wanne for Orb	er Recent Yea	70
Primary Nutrients in Fertilizer	123	101	nages for our	let we cente res	-
Nitrogen	41				_
Phosphorus	39				
Potash	43				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

	Through State	"E" Mile
1970-71	1798	19.7
1971-72	2076	14.3
1972-73	2606 ated Tons Applied on All Hi	10.5

	Herbicides			Fungicides	Total	
Table 1	17.4		16,2	1,2	34,8	
Manure: Kind	of	Tons	of Material	s in Wet Manure De		
Livestock		Manure	Nitroger	n Phosphorus	Potash	
Swine: Table	2	325	5	1	1	
Cattle: Table 3		221.94	124	22	111	
Sheep: Table		40	1	0	0	
Horses: Table 4		2620	18	3	16	
Chickens: Ta		46	1	0	0	
Turkeys: Tab		0				
Total from Li Tons		25225	142	26	128	
Fertilizers:		Tons of C	ommercial Fe	ertilizers Applied		
TO A STATE OF THE PARTY OF THE				mary Nutrients		
Item		Total	Nitrogen	Phosphorus	Potash	
Applied on Cr Table 7	opland:	251	1/2	39.	143	
Lime: Limest	one equivale		ed or applie	ed, tons:		

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograma (kg) Multiply By 0.453 ,4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Michigan 2.0 STATE: Michigan PLANNING SUBAREA: Northeast 2.4 COUNTY: Wexford

Crop Group or Crops	Acres Treated	Amount Used		Amount		SANCTISE OF STREET
	rreated	CONTRACTOR OF THE PARTY OF THE	Acres Treated	Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	21:30	66.8	5210	8.1		
Grains	1110	5.5	370	3.7		
Hay or Grass Silage	3123	31.2	2602	26.0		
Pastured Cropland	2102	21.0	21.02	21.0		
Other Field Crops	18	.5	20	2.3	20	3.0
Vegetables	1080	21.6	600	36.0	900	45.0
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals Total Herbicides, Ins	9863	146.6	6234	97.1	920	18.0

## TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1077	130	2/12	271
1969	650	63	68	131
1972	700	65	65	130

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons Potash, tons\_

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	5288	21,02	2886			
1969	5/123	2306	3117			
1972 5900		2500	31:00			
Wet Manure   Per Anima	Factor: Tons	13.14	6.45			
Wet Manure Defecated: Tons, 1972		32850	21930			
	Defecated: Tons, 1972 n Wet Manure: Nitroge					
	Phospho	rus, tons 55				
	Potash,	tons 27L				

## TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	183	
1969	151	164
1972	100-	352
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	161	11199
Nutrients in Wet Manure: Nitrogen, Tons	2	31
Phosphorus, Tons	0	1
Potash, Tons	2	27

#### TABLE 5-MANURE FROM CHICKENS & THREEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		14058		
1969		11203		
1972		6300		
Wet Manure Fac	tor: Lbs. per bird	82.9		
	ecated: Tons, 1972	261		
Nutrients in W	et Manure: Nitrogen, tons	4	Combined	
	Phosphorus, tons	1		
	Potash, tons	1		1

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(±) 357888	Number I-V farms 1h7
Number of farms	327	Acres in I-V farms 31528
Acres in farms	56989	Cropland I-V farms 19669
Cropland in farms	31754	Harvested cropland
Harvested cropland in far	ms 15762	I-V farms 12027

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	2080	222	0	222
GRAINS	1361	129	0	129
Wheat	247	2/4	0	24
Oats	1077	101	0	101
Barley				
Rye	37	14	0	14
OTHER FIELD CROPS	162	19	14	23
Soybeans	1/12	3	0	3
Potatoes	20	16	14	20
Sugar beets				
Field beans	76	1	0	14
HAY OR GRASS SILAGE	7254	128	0	128
PASTURED CROPLAND	1,628	38	0	38
Cropland used for pasture	3999	19	0	19
Improved pasture	629	19	0	19
VEGETABLES, SWEET CORN, MELONS	908	133	0	133
ORCHARDS	33	9	0	9
BERRIES				
NURSERY & GREENHOUSE PRODUCTS	28	1	0	1
OTHER CROPS	160	0	0	0
Total Fertilizer Used, Tons		683	4	687
Percent of Fertilizer Used		99	1	100

TABLE 7-FERTILIZER	USED IN 1972	TABLE		MESTONE EQUIV	ALENT		
Item	Tons	APPLIED				Tonnage not	
Fertilizer Used on Crops: Solid	921	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	178	1972	1950	100	2050		
Total	1.099	Tonnages for Other Recent Years					
Primary Nutrients in Fertilizer	539	101	inageo zoz oei	No della state	-		
Nitrogen	178	_			-		
Phosphorus	172						
Potash	780						

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2116	16.6
1971-72	2561	17.7
1972-73	31412	22.4
	timated Tons Applied on All H mputed 4992	ighways in 1972-73,

## TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1 Herbicide		Ins	secticides	Fungicides	Total			
			97.1	48.0	291.7			
Manure: Kind of		Tone	Tons of Materials in Wet Manure Defecated					
Livesto	ck	Manure	e Nitroger	Phosphorus	Potash			
Swine: Tal	ble 2	940	15	4	3			
Cattle: T	able 3	54780	307	55	274			
Sheep: Ta	ble 4	161	2	0	2			
Horses: T	able 4	11199	31	1	27			
Chickens:	Table 5	261	14	1	1			
Turkeys:	Table 5							
Total from To	Livestock,	60641	359	64	307			
Fertilizer	8:	Tons of	Commercial Fe	ertilizers Applie	d			
			Pri	mary Nutrients				
It	em	Total	Nitrogen	Phosphorus	Potash			
Applied on Table 7	Cropland:	1099	178	172	189			

Table 8 2050

Salts: Applied on all highways, tons: Table 9 4992

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907,2

## 5.5.2.2 Animal Wastes

There were 1,978,900 metric tons (2,181,336 tons) of wet manure produced from livestock in PSA 2.4. This represented 8 percent of the total manure produced in the Lake Michigan basin. There were 82,100 cows and heifers calved and 111,500 head of other cattle in 1972. Cattle defecates 82 percent of the manure and horses 13 percent. Production levels of livestock are expected to remain fairly stable or decline slightly in this subarea within the next 10 years. The manure production will continue at about the present levels or slightly lower.

# 5.5.2.3

Currently a total of 68,739 metric tons (75,771 tons) of commercial fertilizers are applied to croplands in PSA 2.4 with primary nutrients representing 49 percent of the total. Nitrogen, phosphorus and potash are almost equal in tonnages. Over the next ten years the amount of total cropland is expected to remain about the same. Fertilizers use will remain relatively constant. The percent applied in liquid form may increase slightly.

#### 5.5.2.4 Lime

A total of 53,955 metric tons (59,474 tons) of lime was purchased or applied to croplands in PSA 2.4. Based on present usage rates, liming rates are expected to remain relatively unchanged. Present usage in PSA 2.4 is already well above the Great Lakes Basin average. This is due to the importance of grasses on livestock farms in the planning subarea. Government cost-sharing programs, if operative, will not significantly affect the rates.

#### 5.5.2.5 Salts

At the present time about 58,798 metric tons (64,813 tons) of road de-icing salts are applied to all highways in PSA 2.4. Road de-icing salt usage will increase about in proportion to road mileage increases. There will be changes and improvements in methods; however, application rates are not likely to increase.

# MATERIALS USAGE IN THE LAKE HURON BASIN

### 6.1 Basin Characteristics

The Lake Huron basin is comprised of 22 counties in the eastern half of the Lower Peninsula of Michigan. The counties have a total land area of 3,292,166 hectares (8,134,832 acres). Over one-third of this acreage is in cropland and pasture. Most of the cropland is found in the southern portion of this basin while the northern portion is suited for recreation because of its extensive forest cover.

# 6.1.1 Agricultural Characteristics

This area includes two subareas which are very different in their agricultural complexes. Planning Subarea 3.1 is not generally known for its agriculture but thought of more in terms of recreation, forestry, and less intensive farming. Planning Subarea 3.2, by contrast, is primarily known for its agriculture, representing one of the major navy bean producing regions of the world, with sugar beet production also very important.

Table 6-1 indicates the relative proportions of materials used in the Lake Huron basin as compared to the total U.S. Great Lakes Basin.

Table 6-1
MATERIALS USAGE BASIN RELATIONSHIP -- LAKE HURON 3.0 TO GREAT LAKES

Per harvested acre of cropland	Lake Huron basin	Great Lakes Basin
Lbs of chemicals applied Index of chemicals used	2.46	2.66
Tons of livestock manure defecated Index of manure defecated	2.63 78	3.37 100
Lbs primary nutrients in livestock manure Index primary nutrients in manure	64 78	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	376 16 117	321 22 100
Lbs of primary nutrients in commercial fert Index primary nutrients in commercial fertil		153 100
Lbs of lime applied Index of lime applied	34 20	170 100
Per acre of total land area		
Lbs road salts used Index road salts used	26.11 62.5	41.74 100
To Convert From To Pounds (1b) Kilograms (1) Kilograms (1) Metric Tons	kg)	Multiply By 0.454 907.2 0.907

From an agricultural standpoint there are more similarities between Planning Subarea 3.2 and 4.1 than exist between 3.1 and 3.2. In like manner, discounting the fruit counties, there are more similarities in agriculture in Planning Subarea 3.1 and 2.4 than between 3.1 and 3.2.

Hay and pasture, a major crop in Planning Subarea 3.1, is much less important in 3.2. On the other hand, corn acreage in PSA 3.2 is much more important while field beans and sugar beets (of major importance in 3.2) are hardly grown in PSA 3.1. Livestock production is important in PSA 3.1. It is also important in 3.2, especially in those counties not bordering on Saginaw Bay.

# 6.1.2 Materials Usage

An inventory and analysis on materials usage was made based on personal interviews, correspondence and statistics as available from agricultural statistics, census information, state highway departments, universities, private companies, and state and federal agencies. Background for the analysis is presented in the Methodology Section. Table 6-2 summarizes the findings of this inventory and analysis. Detailed statistics are shown in Table 6-3.

Table 6-2 MATERIALS USAGE (in 1972)

Area Lake Huron basin PSA 3.1 PSA 3.2	Chemicals Applied to Crops (100 lbs) 40,994.4 3,948.2 37,046.2	Livestock Manure (tons) 4,498,921 1,050,967 3,447,954	Commercial Fertilizer on Cropland (tons) 313,257 20,784 292,473	Limestone Purchased or Applied (tons) 28,571 6,281 22,290	Salts Applied to all Highways (tons) 106,203 34,294 71,909
To Convert From Pounds (1b) Tons (ton)		To Kilograms ( Kilograms ( Metric Tons		Multiply 0.45 907.2 0.90	4

# 6.1.2.1 Agricultural Chemicals

There was a total of 1,859,000 kilograms (4,099,440 lbs) of agricultural chemicals used on farm lands in the Lake Huron basin in 1972. Herbicides accounted for the majority of chemical use (77 percent) with insecticides consisting of 15 percent of the total and fungicides being 8 percent. This amounts to 1.11 kilograms (2.46 lbs) of chemicals applied per acre of harvested cropland.

			NAME OF STREET OF STREET		CUIT W	The second section of the	STATE OF THE PARTY OF THE PARTY.	SECOND CONTRACTOR OF SECOND
Agricultural Ch	nemicals, Ma	anures, I	Fertilizers.	Lime	and	Highway	De-Icing	Compounds

PLANNING AREA:	Lake Huron 3.0	STATE:	Michigan	
	North 3.1 (11 Counties)	)		
PLANNING SUBAREA:	Central 3.2 (11 Countie	s)COUNTY:	22 County Totals	

TARLE	1-ESTIMATED	AMOUNTS	OF	CHEMICALS	HISED	ON	CROPS.	1972	

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	1,681,50	12882.5	101/100	1560.2		
Grains	187104	935.6	62368	623.4		
Hay or Grass Silage	100688	1007.0	84408	844.1		
Pastured Cropland	68481	684.8	68481.	684.8	100000	
Other Field Crops	608958	15275.6	46265	1944.2	14107	2116,1
Vegetables	15257	772.1	9301	616.3	9564	802.7
Orchards						
Berries	515	24.8	582	61.5	582	158.7
Nursery, Greenhouse						
Other Crops						
				,		
Totals	11/1/94/53	31582.4	375505	6334.5	21:253	3077.5
Total Herbicides, In	nsecticide	s, Fungio	cides: 10		1849211	40994.1

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	112005	10240	9912	20152	
1969	94343	7888	7872	15760	
1972	914110	10273	8672	18945	

1274	AUUTO 1	10613	20072	-10
Wet Manure	Factor: Tons	per litter farrowe	d 7.23	
Wet Manure	Defecated: To	ns, 1972	136972	
Nutrients	in Wet Manure:	Nitrogen, tons	685	
-		Phosphorus, tons	192	
		Potash, tons	520	

### TABLE 3-MANURE FROM CATTLE

Link		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	475001	188840	286161		
1969	379632	144922	234710		
1972	415000	157400	257600		
Wet Manure F Per Animal	actor: Tons	13.14	6.45		
Wet Manure I Tons, 1972		2068230	1661520		
	Defecated: Tons, 1972 Wet Manure: Nitroge Phospho Potash,	en, tons 20 orus, tons 3	750 887 730 649		

# TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	48613	
1969	34983	10386
1972	28600	40265
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	46046	514587
Nutrients in Wet Manure: Nitrogen, Tons	645	3551
Phosphorus, Tons	97	515 3088
Potash, Tons	460	3088

# TABLE 5--MANURE FROM CHICKENS & THREEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	1874504		
1969	1784053		
1972	1721300		
Wet Manure Factor: Lbs. per bird	82.9		-
Wet Manure Defecated: Tons, 1972	82.9 71348		
Nutrients in Wet Manure: Nitrogen, tons		Combined	
Phosphorus, tons	1113		
Potash, tons	250		

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1	8131832	Number I-V farms 11922
Number of farms	19707	Acres in I-V farms 2532225
Acres in farms	3174496	Cropland I-V farms 1973435
Cropland in farms	2356911	Harvested cropland
Harvested cropland in farms	1665041	I-V farms 1494283

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	323474	47312	10871	58183
GRAINS	256263	32920	590	33510
Wheat	130551	18801	459_	19260
Oats	109551	12179	89	12268
Barley	9210	1273.	36	1309
Rye	5086	465	6	1,71
OTHER FIELD CROPS	617696	88036	3663	91699
Soybeans	76125	6260	133	6393
Potatoes	14247	7198	129	7327
Sugar beets				
Field beans	7578	45	8	53
HAY OR GRASS SILAGE	272405	4833	149	1,882
PASTURED CROPLAND	216655	1777	1.6	1793
Cropland used for pasture	197449	1512	16	1528
Improved pasture	19206	265	0	265
VEGETABLES, SWEET CORN, MELONS	16908	3630	197	3827
ORCHARDS	3161	293	1	29/1
BERRIES	765	163	3	166
NURSERY & GREENHOUSE PRODUCTS	2030	1053	1	1054
OTHER CROPS	2177	260	66	326
Total Fertilizer Used, Tons		180322	15465	195787
Percent of Fertilizer Used		92	8	100

TABLE 7FERTILIZER U	SED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	263136	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	50121 313257	1972	20058	8513	28571
Total Primary Nutrients in Fertilizer	153396	Ton	nages for Oth	er Recent Yea	rs
Nitrogen	50620	_			
Phosphorus	49087				
Potash	53689				

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	66276	49.2
1971-72	74911	51.4
1972-73	73220	47.4
Total Estima As Comput	ted Tons Applied on All H ed 106203	ighways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide		secticides	Fungicides	Total
Table 1	31582.4	6	334.5	3077.5	10991-11
Manure: Ki	nd of	Ton	s of Material	ls in Wet Manure	Defecated
Livestock		Manur	e Nitroge	en Phosphorus	Potash
Swine: Tab	1e 2	137190	685	192	520
Cattle: Ta	ble 3	3729750	20887	3730	18649
Sheep: Tab	le 4	46046	645	97	460
Horses: Ta	ble 4	514587	3551	515	3088
Chickens: Table 5		71348	1113	285	250
Turkeys: T	able 5				
Total from Ton		4498921	26881	4819	22967
Fertilizers	:	Tons of		Fertilizers Appl:	ied
				imary Nutrients	
Ite	111	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	313257	50620	49087	53689

Table 8 28571

Salts: Applied on all highways, tons: Table 9 106203

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453

Chemical usage in the northeast counties (PSA 3.1) is projected to increase modestly. It is believed that usage in the east-central counties (PSA 3.2) will increase more than this - perhaps 15 to 25 percent. It is expected that for the entire area, herbicide use will show a substantial increase (perhaps 15 to 20 percent), fungicides a 5 to 10 percent increase, with insecticides staying at about the persent level. In strong agricultural counties with high valued crops, chemical applications, methods, and rates will be likely to change drastically over the next 10 years. Future food production will depend a great deal upon what our agricultural scientists and researchers are able to discover in the field of chemicals for our use and application.

## 6.1.2.2 Animal Wastes

Livestock, as already stated, will continue to be of prime importance in most of these counties. Cattle and cow numbers have declined about 10 percent in the last 8 years. It is projected that these numbers will hold their own. Horse number increases will not be as fast as in the last few years. Chicken numbers have been decreasing about 1 percent a year. Swine numbers were declining but are now holding their own. Livestock manure production per acre is likely to stay near present levels for the next 10 years. It was calculated that 4,081,350 metric tons (4,498,921 tons) of wet manure were produced annually in the Lake Huron basin. Most of this was produced by cattle (83 percent).

## 6.1.2.3 Commercial Fertilizers

A total of 284,182 metric tons (313,257 tons) of commercial fertilizers were applied to crops in the Lake Huron basin in 1972. Nitrogen accounted for 33 percent, phosphorus 32 percent, and potash 35 percent of the primary nutrient content.

Fertilizer usage, already relatively high, will continue to increase in use more in the southern counties and less for those in the north. The overall area tonnage will likely increase somewhat less than the 25 percent increase projected for PSA 3.2.

# 6.1.2.4 Lime

Lime usage, relatively unimportant in both subareas, will probably continue to be applied at about current levels. In 1972 there were 25,290 metric tons (28,571 tons) of limestone used in the Lake Huron basin. Lime is important in terms of its water quality impacts due to its effects on the pH level of water and subsequent effects on water's acid - base relationships. The possibilities of precipitating phosphorous in the water and alterting calcium content are also likely.

# 6.1.2.5 Salts

Because of severe climatic conditions during winter and the resultant heavy snowfalls, road de-icing salts are required to keep major roadways open. It is estimated that 96,347 metric tons (106,203 tons) were applied to highways in the Lake Huron basin in the 1972-73 winter. The primary impact upon ground and surface waters resulting from road de-icing salts comes from chloride discharges, which can over time affect the salinity

of nearby wells and open water areas. Assuming that chlorides are conservative and that ion exchange between chlorides and various soil types are minimal, most of the chlorides will eventually reach ground and surface water areas.

Road de-icing will most likely continue at the present levels. Changes are foreseen in road de-icing procedures, but they will add up to rates similar to the present, with total quantities depending on changes in road mileages.

# 6.2 Planning Subarea 3.1

This subarea is comprised of 11 counties all in northeast Michigan, 6 of the counties bordering on Lake Huron and the other 5 draining indirectly into the lake. These are not strong agricultural counties, but they do have important agricultural localities in them. Total land area for this area is 1,486,239 hectares (3,672,448 acres). More than 17 percent of the area is in farmland.

# 6.2.1 Agricultural Characteristics

Hay and pasture utilize about 70,800 hectares (175,000 acres), corn and grains about 10,120 to 12,140 hectares (25,000 to 30,000 acres) each, cash crops about 6,475 hectares (16,000 acres) with 809 hectares (2,000 acres) of cucumbers. The cash field crops are dry beans, soybeans and sugar beets and are grown more towards the south and potatoes more in the north.

Table 6-4 indicates the relative proportions of materials usage in Planning Subarea 3.1 in comparison with the total U.S. Great Lakes Basin.

Table 6-4

MATERIALS USAGE BASIN RELATIONSHIP -- PLANNING SUBAREA 3.1 TO GREAT LAKES

Per harvested acre of cropland	Planning Subarea 3.	1 Great Lakes Basin
Lbs of chemicals applied	2.02	2.66
Index of chemicals used	76	100
Tons of livestock manure defecated	4.72	3.37
Index of manure defecated	140	100
Lbs primary nutrients in livestock ma	nure 114	82
Index of primary nutrients in manure	139	100
Lbs commercial fertilizer applied	213	321
Percent liquid fertilizer applied	16	22
Index commercial fertilizer applied	66	100
Lbs primary nutrients in commercial f	ertilizer 103	153
Index primary nutrients in commercial	fertilizer 67	100
Lbs of lime applied	64	170
Index of lime used	38	100
Per acre of total land area		
Lbs road salts used	18,68	41.74
Index road salts used	45	100
To Convert From	0	Multiply By
	grams (kg)	0.454
	grams (kg)	907.2
Metri	Lc Tons	0.907

## 6.2.2 Materials Usage

Table 6-5 lists by county the material usage inventory for Planning Subarea 3.1. Detailed statistics are shown in Tables 6-6 to 6-17.

# 6.2.2.1 Agricultural Chemicals

This subarea in comparison with the total Basin applied less chemicals per acre of harvested cropland. Chemical use will most likely increase modestly in the next ten years - perhaps 10-15 percent. In 1972 there were 179,000 kilograms (394,820 lbs) of agricultural chemicals used. Most of this was in the form of herbicides (55 percent). Insecticides accounted for 29 percent and fungicides 16 percent.

# 6.2.2.2 Animal Wastes

Livestock production, and in turn manure production, may stay about the same in PSA 3.1. Cattle will be the class of livestock to especially observe as it

Table 6-5
MATERIALS USAGE
(in 1972)

	Chemicals Applied to Crops (tons)	Livestock Manure (tons)	Commercial Fertilizer on Cropland (tons)	Limestone Purchased or Applied (tons)	to all
PSA 3.1 Michigan					
Alcona	182.8	108,292	776	1,012	2,885
Alpena	379,5	150,763	1,974	267	3,189
Arenac	1,169.1	128,261	7,736	528	3,680
Cheboygan Crawford	386.1	76,350	963	596	4,796
Iosco	293.9	143,006	1,875	588	3,064
Montmorency		53,536	568	258	2,349
Ogemaw	409.9	157,801	2,413	1,492	3,690
Oscoda	81.0	43,141	518	523	2,349
Otsego	193.3	52,453	854	314	4,412
Presque Isl		137,364	3,107	703	3,880
TOTAL	3,948.2	1,050,967	20,784	6,281	34,294
To Convert Fr	om	T	0	M	Multiply By
Pounds (1b)		Kilog	rams (kg)		0.454
Tons (ton)			rams (kg) c Tons		907.2

produces 85 percent of the manure. Horse numbers, which have been increasing very rapidly, will probably continue to increase but at a slower rate. Livestock intensity, as measured by the manure index, is 40 percent higher than the total Basin. Had total cropland acres been used to compute this index, livestock intensity would have been about 10 per cent higher.

## 6.2.2.3 Commercial Fertilizers

This subarea in comparison with the total Basin applied one-third less commercial fertilizer per acre of harvested cropland. Fertilizer use in 1972 showed that 18,855 metric tons (20,784 tons) were used. Primary nutrients comprised 49 percent of the total fertilizer amount. Nitrogen accounted for 33 percent, phosphorus 32 percent, and potash 35 percent of the primary nutrients.

# 6.2.2.4 Lime

There were 5,698 metric tons (6,281 tons) of lime purchased or applied in Planning Subarea 3.1 in 1972. There is little to suggest that lime usage will change much from present levels.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING	AREA:	Lake Huron 3.0	STATE:	Michigan
PLANNING	SUBAREA:	North 3.1	COUNTY:	11 Subarea County Total

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	34200	940.7	7600	112.7		
Grains	21420	107.2	7140	71.3		
Hay or Grass Silage	32642	326.4	27203	272.1		
Pastured Cropland	27772	277.7	27772	277.7		
Other Field Crops	14471	371.4	3139	291.6	2476	371.4
Vegetables	2203	126.7	1169	42.8	1135	113.5
Orchards						
Berries	515	24.8	582	61.5	582	158.7
Nursery, Greenhouse						
Other Crops						
Totals	133223	2174.9	74505	1129.7	4193	643.6
Total Herbicides, In					212021	3948.

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	9936	1409	1242	2651
1969	8459	954	1036	1990
1972	8800	1173	972	21.45
	re Factor: T	ons per litter f Tons, 1972	15509	
Marked on to	s in Wet Manu	re: Nitrogen, to	ons 78	
Marrienr		Discourage Language	tons 22	
Nucrienc		Phosphorus,	LUIIB GC	

TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	113781	51545	62236
1969	89334	39629	49695
1972	97600	43000	54600
Wet Manure I Per Animal	Pactor: Tons	13,14	6.45
Wet Manure I Tons, 1972	1007-707-100	565020	352170
Wet Manure I	Defecated: Tons, 1972	Combined: 91719	0
Nutrients in	Wet Manure: Nitrog	en, tons 513	16
	Phosph	orus, tons 91	6
	Potash	tons 458	37

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	14453	
1969	8151	1777
1972	6500	7941
Wet Manure Factor: Tons per animal	1,61	12.78
Wet Manure Defecated: Tons, 1972	10461	101486
Nutrients in Wet Manure: Nitrogen, Tons	147	694
Phosphorus, Tons	23	101
Potash, Tons	104	609

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		264138		
1969		148233		
1972		152500		
Wet Manure Fact	or: Lbs. per bird	82.9		
Wet Manure Defe	cated: Tons, 1972	6321		
Nutrients in We	Manure: Nitrogen, tons	98	Combined	
	Phosphorus, tons	24		
	Potash, tons	22		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	3672448	Number I-V farms 1	691
Number of farms	3129	Acres in I-V farms 4	68147
Acres in farms	647321	Cropland I-V farms 2	
Cropland in farms	364717	Harvested cropland	
Harvested cropland in fa	rms 195595	I-V farms 1	60020

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	26307	3791	282	4073
GRAINS	29753	3152	1.3	3165
Wheat	5088	500	5	605
Oats	23006	2369	9	2378
Barley	979	1.23	0	123
Rye	310	38	0	38
OTHER FIELD CROPS	15015	2955	81	3037
Soybeans	1662	161	0	161
Potatoes	2485	1047	26	1.073
Sugar beets				
Field beans	1726	20	5	25
HAY OR GRASS SILAGE	84806	882	4	886
PASTURED CROPLAND	88338	779	0	779
Cropland used for pasture	78747	573	0	573
Improved pasture	9591	206	0	206
VEGETABLES, SWEET CORN, MELONS	2070	377	62	439
ORCHARDS	910	93	0	93
BERRIES	316	86	3	89
NURSERY & GREENHOUSE PRODUCTS	621	375	0	375
OTHER CROPS	295	29	1	30
Total Fertilizer Used, Tons		12540	451	12991
Percent of Fertilizer Used		97	3	1.00

TABLE 7FERTILIZER U	JSED IN 1972	TABLE	APPLIED	MESIUME EQUIV	MEDIAT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	17459	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	3325	1972	5153	1128	6281
Total	20784			er Recent Yes	
Primary Nutrients in Fertilizer	10083	400	mages AVE Sen		+
Nitrogen	3327				
Phosphorus	3226				
Potash	3530				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	27714	28.1
1971-72	25417	24.8
1072-73	23643	22.7
Total Estima As Comput	ted Tons Applied on All Hi	ghways in 1972-73,

TOTAL TURAL MATERIALS AND HICHWAY DE-ICING

Table 1	Herbicide 2174.9		9.7	Fungicides 643.6	Total 3948.2
		Tone	of Motoriale	in Wet Manure De	fecated
Manure: K: Livesto		Manure			Potash
	ole 2	15509	78	22	59
Cattle: Ta		917190	5136	916	4587
Sheep: Tal		10461	147	23	104
Horses: Ta		101486	694	101	609
Chickens:		6321	98	24	22
Turkeys:		-	-	-	-
	Livestock,	1050967	6153	1086	5381
Fertilizer	91	Tons of		rtilizers Applied	1
-			Prim	ary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	20784	3327	3226	3530

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Huron 3.0 STATE: Michigan

PLANNING SUBAREA: North 3.1

COUNTY: Alcona

Crop Group or Crops	Acres Treated	Amount Used	Acres	Amount		Amount
Towns .		100 lbs	Treated	100000000000000000000000000000000000000	Acres Treated	Used 100 1bs
010	1170	32.2	260	2.6		
rains	1236	6.2	41.2	4.1		
lay or Grass Silage	3559	35.6	2966	29.7		
Pastured Cropland	3624	36.2	3624	36.2		
ther Field Crops						
Vegetables						
rchards						
Berries						
ursery, Greenhouse						
Other Crops						

TABLE 2-MANURE FROM SWINE	ANURE FROM SWINE
---------------------------	------------------

Totals 9589 110.2 7262
Total Herbicides, Insecticides, Fungicides:

	Hog & Pig	Number So		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	403	83	73	156
1969	246	14	28	42
1972	300	15	35	50

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 362
Nutrients in Wet Manure: Nitrogen, tons 2
Phosphorus, tons 1
Potash, tons 1

## TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	10970	5212	5758			
1969	8921	4194	4727			
1972	9700	4600	5100			
Wet Manure   Per Anima	Factor: Tons	13.14	6,45			
Wet Manure 1		60444	32895			
	Phosph	Combined: 93339 en, tons 523 orus, tons 93 , tons 467				

# TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2664	
1969	1336	140
1972	1100	899
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1771	11489
Nutrients in Wet Manure: Nitrogen, Tor	ns 25	79
Phosphorus, 1	Tons 4	11
Potash, Tons	18	69

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		13480		
1969		28820		
1972		32100		
Wet Manure Factor:	Lbs. per bird	82.9		
Wet Manure Defecate		1331		
Nutrients in Wet Max	nure:		Combined	
	trogen, tons	21		
Ph	osphorus, tons	5		
Po	tash, tons	5	THE RESERVE	+

# TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	433600	Number I-V farms	143
Number of farms	304	Acres in I-V farms	35894
Acres in farms	55941	Cropland I-V farms	23429
Cropland in farms	34901	Harvested cropland	
Harvested cropland in far	ms15386	I-V farms	11113

	Crop	Tons	of Fertilize	T Used
Crops	Acres	Dry	Liquid	Total
CORN	1167	188	0	188
GRAINS	1664	126	0	126
Wheat	284	26	0	26
Oats	1273	101	0	101
Barley	45	0	0	0
Rye	8	0	0	0
OTHER FIELD CROPS	33	1	0	1
Soybeans	.0	0	0	0
Potatoes	4	1	0	1
Sugar beets		The state of		1000
Field beans	101	0	0	0
HAY OR GRASS SILAGE	8070	56	0	56
PASTURED CROPLAND	10048	80	0	80
Cropland used for pasture	9514	70	0	70
Improved pasture	346	10	0	1.0
VEGETABLES, SWEET CORN, MELONS	35	31	0	31
ORCHARDS	67	. 3	0	. 3
BERRIES	20	0	0	0
NURSERY & GREENHOUSE PRODUCTS	4	0	0	0
OTHER CROPS	2	0	0	0
Total Fertilizer Used, Tons		485	0	485
Percent of Fertilizer Used		100	0	100

#### TABLE 7-FERTILIZER USED IN 1972

TABLE 7FERTILIZER	USED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	652	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	124	1972	1012	D.	1012
Total	776		mages for Oth	on Donner Von	
Primary Nutrients in Fertilizer	380	100	mages for Oth	er secent rea	-
Nitrogen	125				
Phosphorus	122				
Potash	133				

#### TABLE 9-- SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

1970-71 2463	
	28.6
1971-72 2309	27.0
1972-73 1987	21.8

### TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Insec	ticides	Fungicides	Total	
Table 1	110.2	72.6		0	182.8	
Manure: Ki	nd of	Tons o	f Materials	In Wet Manure De	fecated	
Livestoc	k	Manure	Nitrogen	Phosphorus	Potas	
Swine: Tab	le 2	362	2	1	1	
Cattle: Ta	ble 3	9339	523	93	46	
Sheep: Tab	le 4	1771	25	4	18	
Horses: Ta	ble 4	11489	79	11	69	
Chickens:	Table 5	1331	21	5	5	
Turkeys: T	able 5	-	-	20	-	
Total from Ton		24292	650	114	56	

LETTITION .	TORR OT	Commercial rei	CITIZETS Whatter	
		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	776	125	122	133

Lime: Limestone equivalent purchased or applied, tons: Table 8 1012

Salts: Applied on all highways, toms: Table 9 2885

PLANNING AREA:	Lake Huron 3.0	STATE:	Michigan	
PLANNING SUBAREA:	North 3.1	COUNTY:	Alpena	

TARLE 1ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS.	1972	

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	4230	116.3	940	14.1		
Grains	5472	27.4	1824	18.2		
Hay or Grass Silage	4692	46.9	3910	39.1		
Pastured Cropland	3753	37.5	3753	37.5		
Other Field Crops	21	.6	23	2.6	23	3.4
Vegetables	288	17.2	144	4.3	144	14.4
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	18456	245.9	10594	115.8	1.67	17.8
Total Herbicides, In	secticide	s, Fungio	cides: 10	0 1bs	29217	379.5

#### TABLE 2-MANURE FROM SWINE

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	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1171	139	129	268
1969	933	117	126	243
1972	1000	200	100	300
1969 1972	933 1000	117	126 100	243
	e Defecated:		2169	
Nutrients	in Wet Manu	re: Nitrogen, to	ons 11	
		Phosphorus,	tons 3	

Potash, tons\_

## TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	15493	6555	8938			
1969	12683	5411	7272			
1972	13800	5900	7900			
Wet Manure Per Anima		13,14	6.45			
Wet Manure Tons, 197	Defecated:	77526	50955			
	Defecated: Tons, 1972 In Wet Manure: Nitroge Phospho	n, tons 719 rus, tons 128	481			

Year Item	Sheep & Lambs	Horses & Ponies
1964	1447	
1969	640	360
1972	500	1385
Wet Manure Factor: Tons per animal	1.61	12.78
wet Manure Defecated: Tons, 1972	805	1.7700
Nutrients in Wet Manure: Nitrogen, Tons	11	122
Phosphorus, Tons	2	18
Potash, Tons	8	106

# TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	63760		
1972	35114 38800		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure:	1608	Combined	
Nitrogen, tons	25	Companed	
Phosphorus, tons	6	_	
Potash, tons	6	-	-

#### TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	1) 361344	Number I-V farms	270
Number of farms	572	Acres in I-V farms	55077
Acres in farms	92656	Cropland I-V farms	34846
Cropland in farms	52087	Harvested cropland	
Harvested cropland in far	ms 25947	I-V farms	18647

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	1752	266	6	272
GRAINS	5587	602	2	504
Wheat	9.09	98	1	99
Oats	4425	475	2	477
Barley	163	1.6	0	16
Rye	90	13	0	13
OTHER FIELD CROPS	287	49	0	49
Soybeans				
Potatoes	23	9	0	9
Sugar beets			S	
Field beans	243	1	0	1
HAY OR GRASS SILAGE	10683	6.7	4	71
PASTURED CROPLAND	10097	109	0	109
Cropland used for pasture	9493	100	0	100
Improved pasture	604	9	0	9
VEGETABLES, SWEET CORN, MELONS	267	40	2	42
ORCHARDS	26	0	0	0
BERRIES	272	82	3	85
NURSERY & GREENHOUSE PRODUCTS	0			
OTHER CROPS	2	1	0	1
Total Fertilizer Used, Tons		1217	17	1234
Percent of Fertilizer Used		99	1	100

TABLE 7-FERTILIZER	USED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT		
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	1658	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	316	1972	267	0	267		
Total	1974	Tonnages for Other Recent Years					
Primary Nutrients in Fertilizer	867	100	mages for our	I HE COME AGO	-		
Nitrogen	286	_			-		
Phosphorus	277						
Potneh	304						

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	3102	38,7
1971-72	2113	26.5
1972-73	2199	25.9
Total Estima	ted Tons Applied on All Hi	ghways in 1972-73,

	Herbicides		cticides 5.8	Fungicides	Total 379.5
Table 1	245.9		F-W		
Manure: Kin		Tons		In Wet Manure De Phosphorus	Potash
Livestock				2	8
Swine: Tabl		2169	719	128	542
Cattle: Tab		128481	11	2	8
Sheep: Tabl		805	122	18	106
Horses: Tab		17700	25	6	6
Chickens: 7		1508	53	-	-
Turkeys: Ta	ible 5	-	-	-	-
Total from I		150763	888	157	770
Fertilizers		Tons of (	Commercial Fer	tilizers Applied	
Telefition			Prima	ry Nutrients	
Iter		Total	Nitrogen	Phosphorus	Potas
Applied on (		1974	286	277	30h
Lime: Limes		nt purchas	ed or applied	, tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To

Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 .4047 907.2

Agricultural Chemi	cals, Manures, Fert	ilizers, Lime a	nd Highway	De-Icing	Compounds
PLANNING AREA:	Lake Huron 3.0	STATE:	Michig	an	UDI EL
PLANNING SUBAREA:	North 3.1	COUNTY	: Arenac		
The same are anomal	1072	TARIE 6-CI	DOP ACREACE	S & FERTI	LIZER USEI

250 756 594 251	309.4 18.8 35.9 22.5	Acres Treated 2500 1252 2995 2251	Amount Used 100 1bs 37.5 12.5 30.0 22.5	Acres Treated	Amount Used 100 1bs
756 594 251	18.8 35.9 22.5	1252 2995	12,5		
594 251	35.9	2995	30.0		
251	22.5				
	-	2251	22.5		
2615			fa fa a st		
	316.6	1077	54.2	414	62,1
115	109.5	1025	38.5	991	99.1
-		0.500			
5381	812.7	11100	195.2	1405	161.2
	381	5381 812,7	5381 812.7 11100	5381 812.7 11100 195.2	5381 812.7 11100 195.2 1405

TABLE	2MANURE	FROM	SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1596	176	153	329
1969	3217	230	296	526
1972	3300	300	300	600

1972	3300	Duu	200		
Wet Manure	Factor: Tons	per litter	farrowed	7.23	
	Defecated: Ton			4338	
	n Wet Manure:		tons	22	
		Phosphorus		6	
		Potash, to	ns	16	

TABLE	3-MANURE	FROM	CATTLE

		Number Cattl	e and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	15877	6567	9310
1969 1972	10867 11900	4901 5300	5966
	Factor: Tons	13,14	6,45
Wet Manure Tons, 197		69642	42570
			12

TABLE 4-MANURE FROM SHEEP AND HORSES

Year It	em	Sheep & Lambs	Horses & Ponies
1964		482	
1969		301	226
1972		200	775
Wet Manure Factor: Tons	per animal	1.61	12.78
Wet Manure Defecated: To		322	9905
Nutrients in Wet Manure:		5	68
AT GET A PERSON NAMED IN COLUMN NAMED IN COLUM	Phosphorus, Tons	1	10
	Potash, Tons	3	60

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		93322		
1969		33346		
1972		35800		
Wet Manure Fact	or: Lbs. per bird	82.9		
Wet Manure Defe	cated: Tons, 1972	1484		
Nutrients in Wet Manure: Nitrogen, tons		23	Combined	
	Phosphorus, tons	6		
	Potash, tons	5		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres(1)	235136	Number I-V farms	316
Number of farms	544	Acres in I-V farms	70859
	91492	Cropland I-V farms	52789
Cropland in farms	65003	Harvested cropland	
Harvested cropland in farms	41693	I-V farms	36530

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	8420	1384	179	1563
GRAINS	5706	676	3	679
Wheat	1324	189	2	191
Oats	4316	479	1	480
Barley	10	1	0	1
Rye	20	4	0	14
OTHER FIELD CROPS	11040	1903	60	1963
Soybeans	1377	126	0	126
Potatoes	414	206	5	211
Sugar beets				-
Field beans	307	3	5	8
HAY OR GRASS SILAGE	9411	153	0	153
PASTURED CROPLAND	6555	69	0	69
Cropland used for pasture	6309	29	0	29
Improved pasture	246	40	0	40
VEGETABLES, SWEET CORN, MELONS	1704	296	60	356
ORCHARDS	18	14	0	14
BERRIES	0	0	0	5
NURSERY & GREENHOUSE PRODUCTS	30	5	0	
OTHER CROPS	276	25	0	25
Total Fertilizer Used, Tons		4528	307	4835
Percent of Fertilizer Used		94	6	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

TABLE /PERTIFIZER O.	July 241 227	7	APPLIED		
Item	Tons		Tonnage	Tonnage not	Street and the
Fertilizer Used on Crops: Solid	6498	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1238	1972	375	153	528
Total	7736		nages for Oth	er Recent Yea	rs
Primary Nutrients in Fertilizer	3791	100	mageo ror vo		-
Nitrogen	1251				
Phosphorus	1213				
Potash	1327				

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

10.0
18.2
22.6
19.1 ays in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	secticides	Fungicides	Total
Table 1	812.7		195.2	161,2	1169.1
Manure: K	Ind of	Tons	of Material	s in Wet Manure I	efecated
Livesto		Manure			Potash
Swine: Tal		4338	22	6	1.6
Cattle: T		112212	628	112	561
Sheep: Tal		322	5	1	3
Horses: T		9950	68	10	60
Chickens:		1484	23	6	5
Turkeys:		0	0	0	0
	Livestock,	128261	676	135	645
Fertilizer	9:	Tons of	Commercial	Fertilizers Applie	d
			Pri	mary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	7736	1251	1213	1327

Lime: Limestone equivalent purchased or applied, tons:
Table 8 528

Salts: Applied on all highways, tons: Table 9 3680

To Convert From

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Huron 3.0 STATE: Michigan PLANNING SUBAREA: North 3.0 COUNTY: Cheboygan

TABLE 1 POSTMATER AMOUNTS OF CUPMICALS HIGH ON CROPS 1972

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	900	24.8	200	3.0		
Grains	876	4.4	292	2.9		
Hay or Grass Silage	2821	28.2	2351	23.5		
Pastured Cropland	2583	25.8	2583	25.8		
Other Field Crops	9	0	10	1.2	10	1.5
Vegetables						
Orchards				- 3		
Berries	515	24.8	582	61.5	582	158.7
Nursery, Greenhouse						
Other Crops						
Totals	7704	108.0	6018	117.9	592	160.2

TARTE	2	-MANURE	FROM	SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	482	46	43	.89
1969	346	62	43	105
1972	400	65	45	110

Wet Manure Factor: Tons per litter farrowed\_ Wet Manure Defecated: Tons, 1972\_ Nutrients in Wet Manure: Nitrogen, tons\_ Phosphorus, tons Potash, tons

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	9129	4499	4630		
1969	6392	3212	31.80		
1972	7000	3500	3500		
Wet Manure Per Anima	Factor: Tons	13,14	6,45		
Wet Manure Tons, 197		45990	22575		
	Defecated: Tons, 1972 n Wet Manure: Nitroge				
		rus, tons 69			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	830	
1969	415	124
1972	300	503
Wet Manure Factor: Tons per animal	1,61	12.78
Wet Manure Defecated: Tons, 1972	483	6428
Nutrients in Wet Manure: Nitrogen, Tons	7	tht.
Phosphorus, Tons	1	6
Potash, Tons	5	39

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	6393		
1969	2124		
1972	1900		
Wet Manure Factor: Lbs. per bird	82.9		
wet Manure Defecated: Tons, 1972	79		
Nutrients in Wet Manure: Nitrogen, tons	1	Combined	
Phosphorus, tons	0		
Potash, tons	0		1.5

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	(1) 461248	Number I-V farms	103
Number of farms	214	Acres in I-V farms	41199
Acres in farms	54847	Cropland I-V farms	20229
Cropland in farms	27373	Harvested cropland	
Harvested cropland in f	arms 13309	I-V farms	10916

	Crop	Tons o	of Fertilizer	Used	
Crops	Acres	Dry	Liquid	Tota	
CORN	978	116	0	116	
GRAINS	1510	121	0	121	
Wheat	57	14	0	4	
Oats	1284	100	0	100	
Barley	124	1.3	0	13	
Rye	45	5	0	5	
OTHER FIELD CROPS	10	3	0	3	
Soybeans					
Potatoes	10	3	0.	3	
Sugar beets					
Field beans	201	7	0	7	
HAY OR GRASS SILAGE	7506	121	0	121	
PASTURED CROPLAND	9657	155	0	155	
Cropland used for pasture	6855	55	0	55	
Improved pasture	2802	100	0	100	
VEGETABLES, SWEET CORN, MELONS	26	5	0	5	
ORCHARDS	747	73	0	73	
BERRIES	5	1	0	1	
NURSERY & GREENHOUSE PRODUCTS	1	0	0	0	
OTHER CROPS	0				
Total Fertilizer Used, Tons		692	0	502	
Percent of Fertilizer Used		100	0	100	

IN 1972 TABLE 8-CROUND LIMESTONE EQUIVALENT

TABLE 7FERTILIZER	USED IN 1972	TABLE	APPLIED	MESTONS EGOTA	VPPRAT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	809	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	154	1972	396	200	596
Total	963		120701	er Recent Yes	
Primary Nutrients in Fertilizer	472	101	lages 101 UL	Let we cente see	-
Nitrogen	156			-	-
Phosphorus	151				
Potash	165				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	4605	26.6
1971-72	5277	30.6
1972-73	3306	18.0
1972-73 Total Estima	3306 ted Tons Applied on All H	18.0 lghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

m 1 1 - 1	Herbicides 108.0		7.9	Fungicides	Total 386.1
Table 1					
Manure: Kir Livestock		Manure	Nitrogen	n Wet Manure De Phosphorus	Potash
Swine: Tab		795	14	1	3
Cattle: Tal		68565	384	69	343
Sheep: Tab.		483	7	1	5
Horses: Tal		6428	44	6	39
Chickens:		79	1	0	0
Turkeys: T		0	0	0	0
Total from Ton	Livestock,	76350	440	77	390
Fertilizers		Tons of Co	ommercial Fert	ilizers Applied	
TULLERANCE			Primar	y Nutrients	
Ite	n n	Total	Nitrogen	Phosphorus	Potasi
Applied on Table 7	Cropland:	963	156	151	165
Lime: Lime: Table	stone equivale	nt purchase	ed or applied,	tons:	11

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Crop Group

Corn Grains

196

or Crops

## GREAT LAKES BASIN MATERIAL USAGE INVENTORY Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: Michigan

COUNTY, land area, acres (1)

Harvested cropland in farms

Number of farms

Acres in farms
Cropland in farms

COUNTY: Crawford (Census information not available)

Number I-V farms

Acres in I-V farms
Cropland I-V farms
Harvested cropland
I-V farms

TABLE 6-- CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

PLANNING AREA: Lake Huron 3.0

Fungicides

Acres

Treated

Amount Used

100 lbs

PLANNING SUBAREA: North 3.1

Amount Used

Acres (acre) Tons (ton)

Insecticides

100 lbs Treated 100 lbs

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

Amount Used

Herbicides

Acres

Treated

Section   Copy	Pattered Cropland Orchards Orc	Pastured Cropland Other Field Crops Vegetables Orchards Berries Nursery, Greenhouse							_			
PARTICLE CROSS OCHER PRICE CORPS OCHER PRICE COR	Crops Corporation	Pastured Cropland Other Field Crops Vegetables Orchards Berries Nursery, Greenhouse								Cwan T.	ma of Powedlia	on Hond
COLDET FIELD GOTS  SECTION COUNTY  SECTION COU	Other Field Copps Services Ser	Other Field Crops Vegetables Orchards Berries Nursery, Greenhouse					0					
TOTAL	Total Control of the Company of the	Vegetables Orchards Berries Nursery,Greenhouse			-		Crops		-	acres D	ry Liquid	Total
OCALISE  TRETES  TOTAL	O'CANAGE  RETERIS CONTROLLED  OTHER COOPS  OTHER COOPS  OTHER COOPS  OTHER COOPS  OTHER COOPS  TOTAL  TOTAL  TOTAL  TOTAL  ROSP STEE  Rosp STEE	Orchards Berries Nursery, Greenhouse			-		CORN					
Servise   Super Corps   Supe	Note toron to the control of the con	Berries Nursery, Greenhouse										
Note of Companies of the Companies of th	Total Reflictions Insecticions Functions (100 lbs)  Total Reflictions Insecticions Functions (100 lbs)  TABLE 2—MANURE FION SUINS  Total Reflictions Insecticions Functions (100 lbs)  TABLE 2—MANURE FION SUINS  Total September Source Factoria (100 lbs)  TABLE 2—MANURE FION SUINS  Total September Source Factoria (100 lbs)  TABLE 2—MANURE FION SUINS  Total September Source Factoria (100 lbs)  TABLE 2—MANURE FION SUINS  Total September Source Factoria (100 lbs)  TABLE 3—MANURE FION SUINS  Total September Source Factoria (100 lbs)  Total September September Source Factoria (100 lbs)  Total September September Source Factoria (100 lbs)  Total September	Nursery, Greenhouse										_
Other Cropps	Other Cropps								-			-
New	Second Process   Seco	Other Crops							-			
OTRIAL STATE Codes, Insecticides, Insecticides, Insecticides 100 lbs    TABLE 2—MANUEE FROM NATUR  Nos & Pig   Month of Pig   Manuel Nature	Totals To								-			
Sopheses TOTAL Herbicides, Insecticides, Positicides: 100 lbs TABLE 3-MANURE FROM CHIE  Nos & Fig Rubber Sows Partowing Investory Year Dec. 1 Syring Fall Total 1984 1984 1984 1985 Net Namer Sector: Tons par litter farrowed Wee Manure Pactors Tons Partowing TABLE 3-MANURE FROM CATLE  Number Good Relieve Bullers, Steer, Stee	Total substictes, Insecticities, Pungicides: 100 lbs  TABLE 2—MANURE FROM SWINE  Bo 6 Fig Number Sovies Farrowing  Bo 7 Fig Number Sovies Farrowing  Fig Number Sovies Farrowing  Foreign Fore								100			
Totals Total Restrictions, Insecticides, Functions: 100 lbs  Total Restrictions, Insecticides, Functions: 100 lbs  Nog 4 Fig. Investory Dec. 1-New 12 Insections arrowing Investory Dec. 1-New 12 Insections arrowing Fast Dec. 1 Spring Fail Paul   1964 1969  Total Spring Factor: Tons per litter farrowed  Nutrients in Wet Memore: Nitrogen, tons Fotabh, tons Fotabh, tons Fotabh, tons  TABLE 3—MANURE TROM CATINE  Number Cattle and Calves Cows & Reffers Reifers, Steers, Calved Bulls, Calves Bul	Total methodides, insecticides, Fungicides 100 ibs						OTHER FIELD CROPS					
Totals Total Restrictions, Insecticides, Functions: 100 lbs  Total Restrictions, Insecticides, Functions: 100 lbs  Nog 4 Fig. Investory Dec. 1-New 12 Insections arrowing Investory Dec. 1-New 12 Insections arrowing Fast Dec. 1 Spring Fail Paul   1964 1969  Total Spring Factor: Tons per litter farrowed  Nutrients in Wet Memore: Nitrogen, tons Fotabh, tons Fotabh, tons Fotabh, tons  TABLE 3—MANURE TROM CATINE  Number Cattle and Calves Cows & Reffers Reifers, Steers, Calved Bulls, Calves Bul	Total methodides, insecticides, Fungicides 100 ibs						Soybeans					
TOTAL Barbicides, Insecticides, Pungicides: 100 lbs  TABLE 2—MANUEE FROM SVINE  Hog & Fig.  Insective from Svine  Hog & Fig.  Insective from Svine  Hog & Fig.  Insecticides, Pungicides: 100 lbs  Total  Fear Dec. 1 Spring  Fear Dec. 1 Spring  Fear Patt Spring  Fear	TOTAL METHOLISHER, Fungicides 100 lbs											
TABLE 2MANURE FROM SUTUR  No 4 Pig Investory Dec. 1-May 31 June 1-Nov. 30 Year Manure Pactor Tone per litter farrowed Week Manure Defeated Tone, 1972 Noticents in Met Menure: Mitrogen, tone Possible Services of Company 100 Year Total Cow 4 Medican Services of Company 100 Year Total Cow 4 Medican Services of Company 100 Year Total Cow 4 Medican Services of Company 100 Year Total Cow 4 Medican Services of Company 100 Year Total Cow 4 Medican Services of Company 100 Year Total Serv	TABLE 2MANURE FROM SINTE  Ros & Fig Investory Dec. 1-May 31 Jane 1-Nov. 30  Test Dec. 1-May 31 Jane 1-Nov. 30  Total Divid  Ros & Fig Investory Dec. 1-May 31 Jane 1-Nov. 30  Total Divid  Ros & Fig Investory Dec. 1-May 31 Jane 1-Nov. 30  Total Divid  Ros & Fig Investory Dec. 1-May 31 Jane 1-Nov. 30  Total Divid  Ros & Fig Investory Dec. 1-May 31 Jane 1-Nov. 30  Total Divid  Ros & Fig Investory Dec. 1-May 31 Jane 1-Nov. 30  Total Divid  Ros & Fig Investory Dec. 1-May 31 Jane 1-Nov. 30  Total Divid  Ros & Fig Investory Dec. 1-May 31 Jane 1-Nov. 30  Ros Marker Factor Tons per litter farrowed  Week Manure Factor Tons per litter farrowed  Week Manure Factor Tons per litter farrowed  Week Manure Factor Tons Dec. 1-May 31 Jane 1-Nov. 30  Ros Marker Factor Tons Dec. 1-May 31 Jane 31  Ros Marker Factor Tons Dec. 1-May 31 Jane 31  Ros Marker Factor Tons Dec. 1-May 31  Ros Marker Factor Tons Dec. 1-May 31  Ros Marker Factor Tons	Was a state of the							+			
TABLE 2—MANURE FROM SYINE    No. 6 Fig   Number Sour Parcoving   Number Spring   Pail   No. 70 No. 30   Number Spring   Pail   Pail	TABLE 2—MANURE FROM SWINE    Number Sows Parrowing   N											
TABLE 2—MANURE FROM SYNTE  TOTAL  TABLE 3—MANURE FROM STEP AND HORSES  TABLE 4—MANURE FROM STEP AND HORSES  TABLE 5—MANURE FROM STEP AND HORSES  TABLE 4—MANURE FROM STEP AND HORSES  TABLE 5—MANURE FROM CHICKEN 5 TOKETS  TABLE 5—MANURE FROM CHICKEN 5 TOKETS  TABLE 6—MANURE	TABLE 2—MANUNE FROM CATTLE    Number Score Partocoling   Part   P	Total Herbicides, Ins	ecticides, Fungio	cides: 100 lbs								
Rog 6 Ftg   Number Sove Parcoving   Inventory   Next Parcoving   Inventory   Next Parcoving   Next Parcovi	Hog & Fig							B				
Rog & Fig   Number Source   Partroving   Total   Partroving   Partro	Rog & Fig   Number Good Partners   Number Cours	TABLE 2-MANURE FROM	SWINE				PASTURED CROPLAND					
Tarrentory Dec. 1 - Nay 31 June 1-Nov. 30   Total   1964   1964   1964   1964   1964   1964   1964   1964   1965   1965   1965   1966	Table 1   Total   To						Cropland used fo	r pasture				
Tarrentory Dec. 1 - Nay 31 June 1-Nov. 30   Total   1964   1964   1964   1964   1964   1964   1964   1964   1965   1965   1965   1966	Table 1   Total   To	Hog & Pig	Number Son	ws Farrowing			Improved pasture					
Serial   Spring   Fall   Total   Spring   Fall   Total   Spring	Spring   Fall   Total   1964   1969   1979				)			CORN. MELONS				
SERRING   SERRINGUE PRODUCTS   SERVINGE FOR STORE FOR	SERVIES   SERVICE   SERV					-T-				500		
Not Menure Pactor: Tons per litter farrowed Wee Menure Defecated: Tons, 1972 Notrients in Wet Manure: Nitrogen, tons Posaborus, tons    Number Cattle and Calves   Relieve, Sterey, Bulls, Calves   Re	SUBSETY & CORENBURGE FRONDUCTS   TOTAL   TOT	AUGI DECT A	OPILING	rail	1013	11						
1972   Set Manure Pactor: Tons per litter farrowed   Set Manure Pactor: Tons per minal   Set Man	Wet Manure Recors: Tons per litter farrowed  Wet Manure Recors: Tons per litter farrowed  Wet Manure Recors: Tons per litter farrowed  Nutrients fa Wet Manure: Nitrogen, tons  Focab, tons  Nutrients fa Wet Manure: Nitrogen, tons  Focab, tons  Number Cattle and Calwas  Number Cattle and Calwas  Cows & Notifers   Beffers, Steers, Bolls, Calwes   1964   1967   1972   1972   1972   1972   1972   1973   1974   1975   1975   1976   1977	1964						or propriese	-			_
Wat Manure Pactor: Tons per litter farrowed Wat Manure Manure: Mrongous tons Fotash, tons Fotash, tons  Number Cattle and Calves Cows & Heifers Colved Bulls, Calves  Number Cattle and Calves Cows & Heifers Bulls, Calves  Number Cattle and Calves Cows & Heifers Bulls, Calves  Number Cattle and Calves Cows & Heifers Bulls, Calves  Number Cattle and Calves Cows & Heifers Bulls, Calves  Number Cattle and Calves Cows & Heifers Bulls, Calves  Number Cattle and Calves Cows & Heifers Bulls, Calves  Number Cattle and Calves Cows & Heifers Bulls, Calves  Number Cattle and Calves Cows & Heifers Bulls, Calves  Number Cattle and Calves Cows & Heifers Bulls, Calves  Number Cattle and Calves Cows & Heifers Bulls, Calves  Number Cattle and Calves Cows & Heifers Bulls, Calves  Number Cattle and Calves Cows & Heifers Bulls, Calves  Number Personal  Tons Item Tons Tons Tons Tonsage Tonnage not Tonnage Tonnage for Other Recent Vears  Frianty Nutrients in Britage Prisary Nutrients in Stringen Frianty Nutrients in Stringen Frianty Nutrients in Stringen Frianty Nutrients in Stringen Frianty Nutrients in Tonsage for Other Recent Vears  Tonnages for Other Recent Vears  Tonnage for Oth	Motivation   Second	1969						DE LEGINOLIS	-			
Number Cartle and Calves  Number Cartle and	Not Menure Pactor: Tons per litter (and Calves Pack Manure Pactor: Tons per litter (and Calves Pack Manure Pactor: Tons Prophorus, cons Potash, tons    Number Cattle and Calves Pack Manure Manure Pack Manure Pack Manure Pack Manure Pack Manure Manure Pack Manure Manure Pack Manure Manur	1972										
Nurrients in Wet Manure: Nitrogen, tons Phosphorus, tons TABLE 3-MANURE FROM CATTLE  Number Cattle and Calves Cows & Heifers Calved Number Cattle and Calves Cows & Heifers Calved Number Cattle and Calves Solid, Calves Prinary Nutrients in Prinary Nutrients in Prinary Nutrients in Procash Tonsages for Other Recent Years Prinary Nutrients in Procash Tonsages for Other Recent Years Prinary Nutrients in Prinary Nutrients in Procash Tons 1972 Tonsages for Other Recent Years Prinary Nutrients in Prin	Nutrients in Wet Manure: Nitrogen, tons Fhosphorus, tons Fhosphorus, tons From Cartle and Calves Number Cattle and Calves Cows & Heifers Calved Sulls, Calves Fer Anisal 1964 1969 1972 Wet Manure Refeated: Tons Fer Extilizer Nutrients in Wet Manure Nitrogen, tons Fhosphorus, tons Fhosphorus, tons From Shift Nutrients in Wet Manure Refeated: Tons Forem, 1972 Number Cattle and Calves Cows & Heifers Calved Refers Refers, Steers, Sulls, Calves Fittings Fittings Fittings From Mitters Forem, 1972 Number Cattle and Calves Number Cattle and Calves Forem, 1972 Number Cattle and Calves Fittings From Mitters Fittings From Mitters Forem, 1972 Number Cattle and Calves Forem, 1972 Number Cattle and Calves Forem, 1972 Nutrients in Wet Manure Refeated: Tons Forem, 1972 Nutrients in Wet Manure Refeated Forem, 1972 Nutrients in Wet Manure Mitter Refeated: Tons Forem Refer Refeated: Tons Forem Refer Refeated: Tons Forem Refer Refe											
Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Phosphorus Pho	Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Phosphorus, tons Phosphorus, tons Phosphorus, tons Phosphorus, tons TABLE 3—MANURE FROM CATTLE    Number Cattle and Calves   Cows & Heifers   Reifers, Steers, Steers, Steers, Calved   Reifers   Reifers, Steers, Steers, Steers, Calved   Reifers   Reifers, Steers, Steers	Wet Manure Factor: 7	ons per litter fa	arrowed			Percent of Fertili	zer Used				
Notifients in Wet Manure: Sitrogen, tons Potash, tons    Number Cattle and Calves   Cove & Reifers   Reifers, Steers, Calved   Steers, C	Notrients in Wet Manure: Nitrogen, tons Fotab, tons  Number Cattle and Calves Cows & Heifers Calved  Number Cattle and Calves Bulls, calves 1964 1972 1972 1972 1972 1972 1972 1972 1972										7	
Procab, tons Potab, tons Potab, tons Potab, tons Potab, tons    TABLE 3-MANURE FROM CATTLE	Phosphorus, tons Fotah, tons Fotah, tons Fotah, tons Fotah, tons    Item			one			TABLE 7 PERTITE	D HOPD TN 1072	MADE	o chotain	TARRETONE POUT	TAT TIME
TABLE 3—MANURE FROM CATTLE    Number Cattle and Calves   Cove & Heifers   Heifers   Steers   Heifers   Calved   Total   Total	TABLE 3—MANURE FROM CATTLE    Number Cattle and Calves   Cove & Helfers   Reifers   Steers   Reifers   Calved   Cost/Shared   Co	marray an nee man					TABLE /FERTILIZE	K OPED IN 1917	TABL		TIMESTONE EQUIV	ALENI
Number Cattle and Galves  Cover Sheifers  Refers, Steere, Bulls, Calves  1964  1969  1972  1972  Wet Manure Pactor: Tons Per Antmail  Nutrients in Wet Manure: Nitrogen, tons Possphorus, Tons Possphorus Posspho	TABLE 3—MANURE FROM CATTLE    Number Cattle and Calves   Cows & Heifers   Heifers, Steers, Calved   Bulls, Calves   Frinary Nutrients in   Frinary Nutrients   Frinary Nutrients						2000	7.07		APPLIED		
TABLE 3—MANURE FROM CATTLE    Number Cattle and Calves	TABLE 3—MANURE FROM CATTLE    Number Cattle and Calves		rotash, tons	5			Item	Tons		Tanana	Tonnens not	
Number Cattle and Calves  Cows & Heifers   Heifers   Steers   1964   1969   1972   1972   1972   1972   1972   1972   1972   1974   1972   197	Number Cattle and Calves   Number Cattle and Calves   Cows & Helfers   Reifers, Steers,   Financy Nutrients in   Stronger   Financy Nutrients in   Financy Nutrients   Financ						W					Transcourse 1
Number Cattle and Calves  Cows & Heifers Cows & Heifers Galved  1964 1969 1972  Net Hanure Pactor: Tons Per Animal  Wet Manure Defecated: Tons, 1972 Combined: Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Phosphorus, tons Phosphorus, tons Possah, tons  TABLE 4—MANURE FROM SHEEP AND BOXSES  Table 4 1969 1972  Nutrients in Wet Manure: Nitrogen, Tons Prophorus, tons Phosphorus, tons Phosphorus Phosphorus Phosphorus Phosphorus Phosphorus Phosphorus Phosphorus Phosphorus	Number Cattle and Calves Cows & Heifers Cows & Heifers Cows & Heifers Cows & Heifers Bolls, Calved Brinary Nutrients in Forabl Forabl Forabl TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS  TABLE 4-MANURE FROM SHEEP AND HORSES  TABLE 4-MANURE FROM SHEEP AND HORSES  Year Item Stephens Forabl, Tons Forable 2  Cattle: Table 3  Sheep: Table 4  Hornes: Table 5  Tons of Commercial Pertificers Applied on Copland Forable 7  Forable 7  Forable 7  Tons of Commercial Pertificers Applied on Copland Forable 7  Forable 7  Forable 7  Tons of Commercial Pertificers Applied on Copland Forable 7  Forable 7  Forable 7  Tons of Commercial Pertificers Applied on Copland Forable 7  Forable 7  Forable 7  Tons of Commercial Pertificers Applied on Copland Forable 7  Forable 7  Forable 7  Tons of Commercial Pertificers Applied on Copland Forable 7  Forable 7  Tons of Commercial Pertificers Applied on Copland Forable 7  Forable 7  Tons of Commercial Pertificers Applied on Copland Forable 7  Forable 7  Tons of Commercial P											
Number Cattle and Calves Cow & Heifers Steers, 1964 1969 1972 1972 Net Manure Pactor: Tons Per Antmal Nutrients in Wet Manure Defecated: Tons, 1972 Net Manure Defecated: Tons Purchased Tons Applied Per "E" Mile 1970-71 1971-72 1971-72 1972-73 Total Estimated Tons Applied on All Highways in 1972-73, As Computed Net Manure Pactor: Tons per animal Net Manure Pactor: Tons per animal Net Manure Pactor: Tons per animal Net Manure Defecated Tons, 1972 Net Manure Pactor: Tons per animal Net Manure Defecated Tons, 1972 Net Manure Pactor: Tons per animal Net Manure Defecated Tons, 1972 Net Manure Pactor: Tons per animal Net Manure Defecated Tons, 1972 Net Manure Pactor: Tons per animal Net Manure Defecated Tons, 1972 Net Manure Pactor: Tons per animal Net Manure Pa	Number Cattle and Calves   Neifers   Neifers   Steers	TABLE 3—MANURE FROM	CATTLE						Year	Cost/Share	i Cost/Shared	Tonnage
Number Cattle and Calves Core Referes Core Referes, Steers, Calved Core Referes, Steers, 1964 1964 1972 Wet Manure Pactor: Tons Per Antali Nutrients in Wet Manure Introgen, tons Phosphorus, ton	Total   Reifers, Steers,   Reifers   Reifers, Steers,   Reifers,   Reifers						Liquid		1072			
Total Cove & Heifers Bulls, Calves  1964   1969   1972	Total Cove & Heifers Bulls, Calves  1964   1972   1972   1972   1973   1972   1972   1973   1972   1973   1972   1973   1972   1974   1974   1974   1974   1975   1			Number Cattle	and Calves		Total		-			
Tear Total Calved Bulls, Calves  1964 1969 1972 Wet Manure Pactor: Tons Per Animal Wet Manure Defecated: Tons, 1972 Combined: Nutrients in Wet Manure: Nutrough, tons Potash, tons Potash, tons Potash, tons  1971-71 1972 1972 1972  TABLE 4—MANURE FROM SHEEP AND HORSES  Year Item Sheep 6 Horses 6 1964 1969 1979 Nutrients in Wet Manure: Net Manure Pactor: Tons per animal Wet Manure Enfecated: Tons, 1972 Nutrients in Wet Menure: Mitrogen, Tons Potash, tons  TABLE 5—MANURE FROM CHICKENS & TUKKEYS  TABLE 5—MANURE FROM CHICKENS & TUKKEYS  Tear Item Chickens Hens Potash, Tons Pot	Test Total Galved Bulls, Calves  1944 1959 1972  Wet Manure Pactor: Tons Per Antmail Wet Manure Defecated: Tons, 1972 Wet Manure Defecated: Tons, 1972  Wet Manure Defecated: Tons, 1972  Wet Manure Defecated: Tons, 1972  Wet Manure Defecated: Tons, 1972  TABLE 4—MANURE FROM SHEFF AND BORSES  Year Item  Sheep & Horses & Fonis  1944 1959 1972  Wet Manure Pactor: Tons per animal Wet Manure Befecated: Tons, 1972  Wet Manure Factor: Tons per animal Wet Manure Mercated Tons, 1972  TABLE 10—SUMMARY OF ACRICULTURAL MATERIALS AND HIGHMAY DE-ICING  Chemicals: Hundredweight Applied on Cropland  Table 1  Manure: Kind of Manure Nitrogen Phosphorus Fotash Table 1  Manure: Kind of Manure Nitrogen Phosphorus Fotash Table 2  Chemicals: Tons of Materials in Wet Manure Defecated Tons of Materials in Wet Manure Phosphorus Fotash Table 2  Chemicals: Tons of Manure Nitrogen Phosphorus Fotash Table 1  Manure: Kind of Manure Nitrogen Phosphorus Fotash Table 2  Chemicals: Tons of Manure Nitrogen Phosphorus Fotash Table 3  Sheep: Table 4  Chickens: Table 4  Chickens: Table 4  Chickens: Table 5  Tons Of Commercial Fertilizers Applied  Ret Manure Referated: Tons, 1972  Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Phosphorus Phosphorus Phosphorus Phosphorus Phos		C			Stoore	Primary Nutrients	in	To	nnages for O	ther Recent Yes	ITS
Nitrogen   Total   Nitrogen   To	Nitrogen   Step   Step	Year Tota										
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Hectare (ha) Kilograms (kg)

.4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA:	Lake Huron 3.0	STATE: Michigan	
PLANNING SUBARRA	North 3 1	COUNTY: Tosco	

-			-			2600		4.45.00.00
TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS,	1972

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	5040	138.6	1120	16.8		
Grains	1620	8.1	540	5.4		
Hay or Grass Silage	3160	31.6	2634	26.3		
Pastured Cropland	3122	31.2	3122	31.2		
Other Field Crops	14	0	16	1.8	16	2.4
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse				5.0		
Other Crops						
Totals	12956	2095	7432	81.5	16	2.4
Total Herbicides, In		s, Fungio		0 1bs	20404	293.4

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1932	306	335	641
1969	1281	234	242	476
1972	1300	300	200	500
	re Factor: Tre Defecated:	ons per litter fa Tons, 1972	3615	
Wet Manu	re Defecated:		3615	
Wet Manu	re Defecated:	Tons, 1972	3615 ons 18	

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	13089	6367	6722
1969	12766	4730	8036
1972	14000	51.00	8900
Wet Manure H Per Animal	actor: Tons	13,14	6.45
Wet Manure I Tons, 1972		67014	57405
	Defecated: Tons, 197		
		horus, tons 124	
		h, tons 622	

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1817	
1969	1022	276
1972	800	1039
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1288	13278
Nutrients in Wet Manure: Nitrogen, Tons	18	92
Phosphorus, Tons	3	13
Potash, Tons	13	80

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	11226		
1969	9153		
1972	9800		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	406		
Nutrients in Wet Manure:	6	Combined	
Nitrogen, tons Phosphorus, tons	2		
Potash, tons	1		+

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	347904	Number I-V farms	155
Number of farms	311	Acres in I-V farms	
Acres in farms	74498	Cropland I-V farms	28359
Cropland in farms	36703	Harvested cropland	
Harvested cropland in farms	17776	I-V farms	15012

	Crop	Tons o	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Tota		
CORN	3423	389	11	400		
GRAINS	2204	233	8	241		
Wheat	340	29	2	31		
Oats	1723	196	6	202		
Barley	8	0	0	0		
Rye	5	0	0	0		
OTHER FIELD CROPS	506	55	0	55		
Soybeans	23	2	0	2		
Potatoes	1.6	6	0	6		
Sugar beets						
Field beans	389	0	.0	0		
HAY OR GRASS SILAGE	8314	72	0	72		
PASTURED CROPLAND	9662	32	.0	32		
Cropland used for pasture	9212	17	0	1.7		
Improved pasture	450	15	0	15		
VEGETABLES, SWEET CORN, MELONS	28	2	0	2		
ORCHARDS						
BERRIES						
NURSERY & GREENHOUSE PRODUCTS	585	370	0	370		
OTHER CROPS						
Total Fertilizer Used, Tons		1153	19	1172		
Percent of Fertilizer Used		98	2	100		

TABLE 7FERTILIZER	USED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENI
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	1575	Year	Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	300	1972	438	150	588
Total	1875		pages for Oth	er Recent Yes	
Primary Nutrients in Fertilizer	919	100	mages for ser	The gent and	-
Nitrogen	303	_			
Phosphorus	294				
Potash	322				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2024	23.7
1971-72	2799	33.0
1972-73	2113	23.3
Total Estima As Comput	ted Tons Applied on All Hi	ghways in 1972-73,

	Herbicides	Ins	ecticides	Fungicides	Total
Table 1	138.6	8	1.5	2.4	222.5
Manure: K	ind of	Tons	of Materials	in Wet Manure De	
Livesto	k	Manure	Nitrogen	Phosphorus	Potash
Swine: Tal		3615	18	5	14
Cattle: Ta	able 3	124419	697	124	622
Sheep: Tal	ole 4	1288	18	3	13
Horses: Ta	able 4	13278	92	13	80
Chickens:	Table 5	406	6	2	1
Turkeys:	Table 5	0	0	0	0
Total from Tot	Livestock,	143006	831	147	730
Fertilizer	11	Tons of	Commercial Fer	tilizers Applied	1
			Prima	ry Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	1875	303	294	322

(1) County, land area, acres includes water areas under 40 acres in size.

Salts: Applied on all highways, tons: Table 9 3064

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
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STATE: Michigan PLANNING AREA: Lake Huron 3.0 COUNTY: Montmorency

PLANNING SUBAREA: North 3.1

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Used 100 1b
Corn	1260	34.7	280	4.2		
Grains	1536	7.7	512	5.1		
Hay or Grass Silage	1462	14.6	1218	12.2		
Pastured Cropland	1776	17.8	1776	17.8		
Other Field Crops	6	0	6	1.0	6	1.0
Vegetables				DOS TOTAL		
Orchards				100		
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	6040	74.8	3792	40.3	9838	1.0

TARLE	2MANURE	FROM	SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	138	16	13	29
1969	161	14	15	29
1972	200	18	1.7	35

Phosphorus, tons Potash, tons

TABLE 3-MANURE FROM	CATTLE
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		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	5535	2689	2846			
1969	4322	2095	2227			
1972	4700	2300	2400			
Wet Manure F Per Animal	actor: Tons	13.14	6,45			
Wet Manure I		30222	15480			
	Defecated: Tons, 1					
MALTERICS TI	Pho	sphorus, tons 46				
	Pot	ash, tons 229				

## TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1384	
1969	519	87
1972	500	514
Wet Manure Factor: Tons per animal	1.61	12,78
Wet Manure Defecated: Tons, 1972	805	6569
Nutrients in Wet Manure: Nitrogen, Tons	11	39
Phosphorus, Tons	2	7
Potash, Tons	8	39

#### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	8824		70.0
1969	81.01		
1972	5000		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	207		
Nutrients in Wet Manure:		Combined	-
Nitrogen, tons	3		
Phosphorus, tons	1		
Potash, tons	1		3

# TABLE 6-- CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, a	cres 355135 (1)	Number I-V farms 76
Number of farms	134	Acres in I-V farms 20657
Acres in farms		Cropland I-V farms 12811
Cropland in farms	17489	Harvested cropland
Harvested cropland i	n farms 7835	I-V farms 6205

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	1025	133	1.0	143
GRAINS	1327	129	0	129
Wheat	163	1.4	0	14
Oats	1100	109	0	109
Barley	44	4	0	4
Rye	20	2	0	2
OTHER FIELD CROPS	179	34	0	34
Soybeans	The state of the s			
Potatoes	7	4	0	4
Sugar beets				
Field beans	14	0	0	0
HAY OR GRASS SILAGE	3682	21	0	21
PASTURED CROPLAND	5116	25	0	25
Cropland used for pasture	5026	25	0	25
Improved pasture	90	0	0	0
VEGETABLES, SWEET CORN, MELONS				
ORCHARDS				
BERRIES	12	2	0	2
NURSERY & GREENHOUSE PRODUCTS				
OTHER CROPS	1	0	1	1
Total Fertilizer Used, Tons		344	11	355
Percent of Fertilizer Used		97	3	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

Albana /			APPLIED		
Item	Tons	-	Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	477	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	91	1972	258	0	258
Total	568	Tor		er Recent Yes	
Primary Nutrients in Fertilizer	278	101	nages for our	The contract of	-
Nitrogen	92				
Phosphorus	89				
Potash	97				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1874	27.9
1971-72	1874	18.8
1972-73	1620	22.7
Total Estima	ted Tons Applied on All H	ighways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Inse	ecticides	Fungicides	Total
Table 1	74.8	4	0.3	1.0	116.1
Manure: K	ind of	Tons	of Materials	in Wet Manure De	fecated
Livesto	7000 0M0000	Manure	Nitrogen	Phosphorus	Potash
Swine: Tal		253	1	0	1
Cattle: Ta		45702	256	46	229
Sheep: Tal		805	11	2	8
Horses: Ta		6569	39	7	39
Chickens:	Table 5	207	3	1	1
Turkeys: '	Table 5	0			
Total from To	Livestock,	53536	310	56	278
Fertilizer	s:	Tons of	Commercial Fer	rtilizers Applie	d
			Prima	ary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potasi
Applied on		568	92	89	97

Table 7 Lime: Limestone equivalent purchased or applied, tons:

Table 8 Salts: Applied on all highways, tons: Table 9 2349

 County, land area, acres includes water areas under 40 acres in size. To Multiply By Kilograms (kg)

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Huron 3.0 STATE: Michigan

PLANNING SUBAREA: North 3.1 COUNTY: Ogemaw

TABLE 6 CROP ACPEAGES & FERTILIZER USS

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	7380	203.0	1640	24.6		
Grains	2712	13.6	904	9.0		
Hay or Grass Silage	5318	53.2	4432	44.3		
Pastured Cropland	3114	31.1	3114	31.1		
Other Field Crops						
Vegetables						
Orchards						
Berries		100				
Nursery, Greenhouse	1/2					
Other Crops						
Totals	18524	300.9	10090	109.0	-	-
Total Herbicides, In	secticide	s, Fungio	ides: 10	00 1bs	28614	409.9

TABLE	2MANURE	FROM	SWINE	

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	1561	152	173	325
969	836	107	93	200
1972	900	100	100	200

 Wet Manure Factor: Tons per litter farrowed
 7.23

 Wet Manure Defecated: Tons, 1972
 1446

 Nutrients in Wet Manure: Nitrogen, tons
 7

 Phosphorus, tons
 2

 Potash, tons
 5

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	17882	7815	10067		
1969	13232	6183	7049		
1972	14500	6700	7800		
Wet Manure Per Anima	Factor: Tons	13.14	6.45		
Wet Manure Tons, 197		88038	50310		
	Defecated: Tons, 1972 n Wet Manure: Nitrog		48		
	2000 2000 AND	, tons 692			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	3341	
1969	2111	254
1972	1700	1188
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2737	15183
Nutrients in Wet Manure: Nitrogen, Tons	38	105
Phosphorus, Tons	6	15
Potash, Tons	27	91

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	7597		
1969	1998		
1972	2100		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	87		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	1		
Phosphorus, tons	0		
Potash, tons	0		+

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	365696	Number I-V farms	205
Number of farms	369	Acres in I-V farms	64274
Acres in farms	83003	Cropland I-V farms	38219
Cropland in farms	48767	Harvested cropland	
Harvested cropland in farm	ns 28817	I-V farms	25190

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	5837	842	24	866
GRAINS	4275	404	0	404
Wheat	1018	84	0	84
Oats	3187	315	0	31.5
Barley	10	2	0	2
Rye	100000	7.6		
OTHER FIELD CROPS	2	0	0	0
Soybeans				
Potatoes	2	0	0	0
Sugar beets				-
Field beans	405	8	0	8
HAY OR GRASS SILAGE	14937	177	0	177
PASTURED CROPLAND	11177	50	0	50
Cropland used for pasture	9521	49	0	49
Improved pasture	1656	1	0	1
VEGETABLES, SWEET CORN, MELONS	2	0	0	0
ORCHARDS	41	3	0	3
BERRIES				
NURSERY & GREENHOUSE PRODUCTS				
OTHER CROPS				
Total Fertilizer Used, Tons		1.484	24	1508
Percent of Fertilizer Used		98	2	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

			APPLIED			
Item	Tons		Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	2027 Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	386	1972	1292	200	1492	
Total	2413			ner Recent Years		
Primary Nutrients in Fertilizer	1182	101	mages for our	ALCOHE TO	-	
Nitrogen	390				-	
Phosphorus	378					
Potash	414					

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2770	28.1
1971-72	2006	17.6
1972-73	2544	22.7
Total Est	imated Tons Applied on All H	ighways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	s In	secticides	Fungicides	Total
Table 1	300.9	10	09.0	0	409.9
Manure: K	ind of	Ton	s of Materia	ls in Wet Manure	Defecated
Livesto	ECC CASOMULA	Manur	e Nitrog	en Phosphorus	Potash
Swine: Tal		1446	7	2	5
Cattle: T		138348	775	138	692
Sheep: Table 4		273.7	38	6	27
lorses: Table 4 15		15183	1.05	15	91
Chickens:	Table 5	87	1	0	0
Turkeys:		0			
Total from Livestock, Tons		157801	831	161	815
Fertilizer	s:	Tons of		Fertilizers Appli	ed
				imary Nutrients	-
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	2413	390	378	414

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 3690

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Huron 3.0 STATE: Michigan PLANNING SUBAREA: North 3.1 COUNTY: Oscoda

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	810	22.3	180	2.7		
Grains	240	1.2	80	8		
Hay or Grass Silage	1686	16.9	1405	14.0		
Pastured Cropland Other Field Crops	1186	11.9	1186.	11,9		
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
				- 5		
Totals	3922	52.3	2851	28.7	20	4.
Total Herbicides, In	secticide	s. Fungio	ides: 10	0 lbs	6773	81.0

MADER 2 MANUER PROM CUITAR

	Hog & Pig	Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	759	196	112	308
1969	337	34	30	64
1972	300	30	30	60

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 434
Nutrients in Wet Manure: Nitrogen, tons 2 Phosphorus, tons\_ Potash, tons\_

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves			
1964	4876	2397	2479			
1969	3415	1474	1941			
1972	3700	1600	2100			
Wet Manure I Per Animal	actor: Tons	13.14	6.45			
Wet Manure I		21024	13545			
Wet Manure 1	Defecated: Tons, 197 Wet Manure: Nitro	2 Combined: 34569	13343			

TABLE 4-MANURE FROM SHEEP AND HORSES

Sheep & Lambs	Horses & Ponies
1471	
884	1.52
700	546
1.61	12.78
1127	6978
16	48
2	7
11	42
	Lambs  1471 884 700  1.61 1127 16 2

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	31250		
1969	5744		
1972	800		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	33		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	1		
Phosphorus, tons	0		
Potash, tons	0		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	360192	Number I-V farms	71
Number of farms	95	Acres in I-V farms	21644
Acres in farms	24960	Cropland I-V farms	12418
Cropland in farms	13711	Harvested cropland	
Harvested cropland in farms	7518	I-V farms	7163

	Crop	Tons o	of Fertilize	Used
Crops	Acres	Dry	Liquid	Total
CORN	918	143	25	168
GRAINS	791	82	0	82
Wheat	128	12	0	12
Oats	663	70	:0	70
Barley		-		
Rye	-			
OTHER FIELD CROPS				
Soybeans				
Potatoes				
Sugar beets				
Field beans	5	0	0	0
HAY OR GRASS SILAGE	5312	60	0	60
PASTURED CROPLAND	4187	14	0	14
Cropland used for pasture	4071	14	0	14
Improved pasture	116	0	9	0
VEGETABLES, SWEET CORN, MELONS				
ORCHARDS			-	
BERRIES				
NURSERY & GREENHOUSE PRODUCTS	1	0	0	0
OTHER CROPS				
Total Fertilizer Used, Tons		299	25	324
Percent of Fertilizer Used		92	8	100

TABLE 7 PERTILIZED HISED IN 1972 TABLE 8-CROUND LIMESTONE EQUIVALENT

TABLE / FERTILIZER USED IN 17		IADLE	APPLIED	IMUZUKU DQUZ	*******
Item	Tons		Tonnage	Tonnage not	
Pertilizer Used on Crops: Solid	435	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	83	1972	498	25	523
Total	518			er Recent Yea	
Primary Nutrients in Fertilizer	254	101	mages for our	lex recent ree	-
Nitrogen	84				-
Phosphorus	81				
Potash	89				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1875	27.9
1971-72	1257	18.8
1972-73	1620	22.7
Total Estima As Comput	ted Tons Applied on All Hi ed 2349	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	I 11 A L L L L L	s Insecticides 28.7		Fungicides	Total
Table 1	Herbicides 52.3			rungicides	81.0
rapre r	36.3	60	./	9 1	01.0
Manure: K	ind of	Tons o	of Materials i	n Wet Manure De	fecated
Livesto	ck	Manure	Nitrogen	Phosphorus	Potash
Swine: Tab	ole 2	434	2	1	2
Cattle: Ta	able 3	34569	194	35	173
Sheep: Tal	ole 4	1127	1.6	2	111
Horses: Ta	able 4	6978	48	7	42
Chickens:	Table 5	33	1	0	0
Turkeys:	Table 5	0			
Total from Tor	Livestock,	1/37/17	261	45	228
Fertilizer	8:	Tons of Co		ilizers Applied	
			Primar	ry Nutrients	4
It	em	Total	Nitrogen	Phosphorus	Potasi
Applied on	Cropland:				

Fertilizers:	Tons of	Commercial Fer	tilizers Applied		
		Primary Nutrients			
Item	Total	Nitrogen	Phosphorus	Potash	
Applied on Cropland: Table 7	518	84	81	89	

Lime: Limestone equivalent purchased or applied, tons: Table 8 523

Salts: Applied on all highways, tons: Table 9 2349

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 ,4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
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PLANNING AREA: Lake Huron 3.0 STATE: Michigan COUNTY: Otsego

PLANNING SUBAREA: North 3.1

	Herb1	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	810	22.3	180	2.7		
Grains	684	3.4	228	2.3	-	
Hay or Grass Silage	2225	22.2	1855	18.6		
Pastured Cropland	1706	17.1	1706	17.1		
Other Field Crops	270	8.1	300	34.5	300	45.0
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	5695	73.1	4269	75.2	300	45.0

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	vs Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	317	60	30	90
1969	382	46	42	88
1972	400	45	45	90

		Number Cattle and Calves				
Year Total		Cows & Heifers Calved	Heifers, Steers Bulls, Calves			
1964	5814	2431	3383			
1969	4304	1964	2340			
1972	4700	2100	2600			
Wet Manure F Per Animal	actor: Tons	13.14	6.45			
Wet Manure I Tons, 1972		27594	16770			
	Defecated: Tons, 1972		4			
mutrients in	Wet Manure: Nitroge Phospho	n, tons 248 rus, tons 44				
	Potash.					

TABLE 4-MANURE FROM SHEEP AND HORSES

Year	Item	Sheep & Lambs	Horses & Ponies
1964		309	
1969		496	101
1972		400	528
Wet Manure Factor	r: Tons per animal	1.61	12.78
	ated: Tons, 1972	640	6748
Nutrients in Wet	Manure: Nitrogen, Tons	9	47
	Phosphorus, Tons	1	7
	Potash Tons	6	40

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		5673		
1969		1241		
1972		1200		
Wet Manure Factor:	Lbs. per bird	82.9		
wet Manure Defecat	ed: Tons, 1972	50		
Nutrients in Wet M	anure: itrogen, tons	1	Combined	
P	hosphorus, tons	0		
	otash, tons	0		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	337536	Number I-V farms 110
Number of farms	172	Acres in I-V farms 35594
Acres in farms	46052	Cropland I-V farms 15840
Cropland in farms	19922	Harvested cropland
Harvested cropland in farm	s 10350	I-V farms 9057

	Crop	Tons o	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Tota		
CORN	890	123	6	129		
GRAINS	1458	127	0	127		
Wheat	160	24	0	24		
Oats	1041	74	0	74		
Barley	148	18	0	1.8		
Rye	67	8	0	8		
OTHER FIELD CROPS	443	170	0	170		
Soybeans	112	12	0	12		
Potatoes	302	155	0	155		
Sugar beets						
Field beans	9	1	0	1		
HAY OR GRASS SILAGE	6347	55	0	55		
PASTURED CROPLAND	6573	48	0	48		
Cropland used for pasture	4856	39	0	39		
Improved pasture	1717	9	0	9		
VEGETABLES, SWEET CORN, MELONS	6	1	0	1		
ORCHARDS	4	0	0	0		
BERRIES						
NURSERY & GREENHOUSE PRODUCTS						
OTHER CROPS	14	3	0	3		
Total Fertilizer Used, Tons		528	6	534		
Percent of Fertilizer Used		99	1	100		

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

Item	Tons
Fertilizer Used on Crops: Solid	717
Liquid	137
Total	854
Primary Nutrients in Fertilizer	418
Nitrogen	138
Phosphorus	134
Potash	146

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
1972	314	0	31.4
Ton	nages for Oth	er Recent Yea	rs
		-	-

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2855	28.6
1971-72	3293	33.2
1972-73	3042	28.8
Total Estima	ated Tons Applied on All Hi	ghways in 1972-73,

P 10 CHAMARY OF ACRICHT THRAI MATERIALS AND HIGHWAY DE-ICING

	Herbicides			Fungicides	Total
Table 1	73.1		5.2	45.0	193.3
Manure: Kind of		Tons		in Wet Manure De	
Livesto	ck	Manure	Nitrogen	Phosphorus	Potash
Swine: Tal	ole 2	651	3	1	2
Cattle: Ta	able 3	44364	248	44	555
Sheep: Tal	ole 4	640	9	1	- 6
Horses: Table 4		6748	47	7	40
Chickens: Table 5		50	1	0	0
Turkeys: Table 5		0			
Total from Livestock, Tons		52453 308		53	270
Fertilizer	9:	Tons of		rtilizers Applied	1
				ary Nutrients	
Ite	em	Total	Nitrogen	Phosphorus	Potasi
Applied on Cropland: Table 7		854 138		134	146
	estone equival	lent purchas	sed or applied	d, tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Huron 3.0 STATE: Michigan

PLANNING SUBAREA: North 3.1

COUNTY: Presque Isle

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated		Acres Treated	Amount Used 100 lbs
Corn	1350	37.1	300	4.5		
Grains	3288	15.4	1096	11.0		
Hay or Grass Silage	4125	41.2	3437	34.4		
Pastured Cropland	4657	46.6	4657	46.6		
Other Field Crops	1536	46.1	1707	196.3	1707	256.0
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	211056	107 1	11107	202.0	1.707	255 0
Total Herbicides, In	14956				1707 27860	736.2

TABLE	2MANURE	FROM	SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1577	235	181	416
1969	720	96	121	217
1972	700	100	100	200

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves	
1964	15116	7013	8103	
1969	12432	5465	6957	
1972	13600	5900	7700	
Wet Manure Per Anima	Factor: Tons	13.14	6.45	
Wet Manure Tons, 197	783000000000000000	77526	49665	
	Defecated: Tons, 1972 n Wet Manure: Nitroge			
	Potash,			

## TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	708	
1969	327	57
1972	300	564
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	483	7208
Nutrients in Wet Manure: Nitrogen, Tons	7	50
Phosphorus, Tons	1	7
Potash, Tons	5	43

TABLE 5-MANIRE FROM CHICKENS & THEFTE

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		22613		
1969		22592		
1972		25000		
Wet Manure Fact	or: Lbs. per bird	82.9		
Wet Manure Defe	cated: Tons, 1972	1036		
Nutrients in We	Nitrogen, tons	16	Combined	
	Phosphorus, tons	4		
	Potash, tons	4	100	-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	414656	Number I-V farms 242
Number of farms	414	Acres in I-V farms 68082
Acres in farms	95521	Cropland I-V farms 37274
Cropland in farms	48761	Harvested cropland
Harvested cropland in farms	24964	I-V farms 20187

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	1897	207	21	228
GRAINS	5231	652	0	552
Wheat	705	120	0	120
Oats	3994	450	0	450
Barley	427	69	0	69
Rye	55	6	0	6
OTHER FIELD CROPS	2515	741	21	762
Soybeans	150	21	0	21
Potatoes	1707	663	21	684
Sugar beets				
Field beans	52	0	0	0
HAY OR GRASS SILAGE	10544	100	0	100
PASTURED CROPLAND	15266	197	0	197
Cropland used for pasture	13890	175	0	175
Improved pasture	1376	22	0	22
VEGETABLES, SWEET CORN, MELONS	2	2	0	2
ORCHARDS	7	0	0	0
BERRIES	7	1	0	1
NURSERY & GREENHOUSE PRODUCTS	0	0	0	0
OTHER CROPS				
Total Fertilizer Used, Tons		1900	42	1942
Percent of Fertilizer Used		98	2	100

TABLE 7FERTILIZER	USED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	2610	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	497	1972	202	1100	703
Total	3107		303	400	703
Primary Nutrients in		lon	nages for Uti	er Recent Yes	rs
Fertilizer	1522				-
Nitrogen	502				
Phosphorus	487				
Potash	533				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	3856	32.8
1971-72	2290	19.6
1972-73	2675	21.5
Total Estima As Comput	ted Tons Applied on All Hi ed 3880	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Manure		Herbicide	-		Fungicides	Total
Livestock Manure Nitrogen Phosphorus Pc Swine: Table 2 1446 7 2 5 Cattle: Table 3 127191 712 127 6 Sheep: Table 4 483 7 1 5 Horses: Table 4 7208 50 7 6 Chickens: Table 5 1036 16 4 5 Turkeys: Table 5 0 7 Total from Livestock, Tons 137364 792 141 6 Fertilizers: Tons of Commercial Fertilizers Applied Primary Nutrients Tem Total Nitrogen Phosphorus Pc	Table 1	187.4	29	2.8	256.0	736.2
Swine: Table 2	Manure: Kind of		Tons	of Material	ls in Wet Manure D	efecated
Cattle: Table 3 127191 712 127 6 Sheep: Table 4 483 7 1 Horses: Table 4 7208 50 7 Chickens: Table 5 1036 16 4  Turkeys: Table 5 0 Total from Livestock, Tons 137364 792 141  Fertilizers: Tons of Commercial Fertilizers Applied Primary Nutrients Item Total Nitrogen Phosphorus Po	Livestoc	k	Manure	Nitroge	en Phosphorus	Potash
Sheep: Table 4	Swine: Tab	le 2	1446	7	2	5
Note	Cattle: Ta	ble 3	127191	712	127	636
Chickens: Table 5   1036   16   4   5     Turkeys: Table 5   0   7     Total from Livestock, Tons   137364   792   141   6     Fertilizers: Tons of Commercial Fertilizers Applied   Primary Nutrients     Total Nitrogen Phosphorus Po	Sheep: Tab	le 4	483	7	1	5
Turkeys: Table 5	Horses: Table 4		7208	50	7	43
Total from Livestock, Tons 137364 792 141 6  Fertilizers: Tons of Commercial Fertilizers Applied Primary Nutrients  Item Total Nitrogen Phosphorus Po	Chickens: Table 5		1036	16	I†	4
Tons	Turkeys: T	able 5	0			
Ttem Total Nitrogen Phosphorus Po			137364	792	141	693
Item Total Nitrogen Phosphorus Po	Fertilizers	:	Tons of	Commercial	Fertilizers Applie	d
				Pr	imary Nutrients	
	Ite	m —	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: 3107 502 487 53		Cropland:	3107	502	487	533

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 .4047 907.2

#### 6.2.2.5 Salts

Major highways passing through this subarea link southeast and eastern Michigan with the Upper Peninsula. Road de-icing use is rather high and will likely continue so. In 1972 there were 31,111 metric tons (34,294 tons) of salts applied in highways in this planning subarea.

# 6.3 Planning Subarea 3.2

Eleven Michigan counties comprise this planning subarea in the southeastern portion of the state. Total land area equals 1,805,926 hectares (4,462,384 acres), with lands in farms equaling 1,022,747 hectares (2,527,175 acres) or 56 percent of the total land area.

# 6.3.1. Agricultural Characteristics

This subarea is one of the most fertile and most productive agricultural regions in Michigan. It is commonly known as the "Saginaw Valley". Looking at ones right hand with palm up, it is the region in Michigan extending from the tip of the thumb down and around and then up to about the base of the fourth finger. Four of the eleven counties border on Saginaw Bay (Lake Huron) and all drain into the Bay.

Table 6-18 indicates the relative proportions of materials usage in the planning subarea as compared to the total U.S. Great Lakes Basin.

Table 6-18

MATERIALS USAGE BASIN RELATIONSHIP -- PSA 3.2 TO GREAT LAKES

Per harvested acre of cropland	Planning Subarea 3.	2 Great Lakes Basin
Lbs of chemicals applied Index of chemicals applied	2.52	2.66 100
Tons of livestock manure defecated Index of manure defecated	2.35 70	3.37 100
Lbs of primary nutrients in livestock m Index of primary nutrients in manure	anure 57 70	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	398 16 124	321 22 100
Lbs primary nutrients in commercial fer Index primary nutrients in commercial fe	tilizer 195 rtilizer 127	153 100
Lbs of lime applied Index of lime used	30 18	170 100
Per acre of total land area Lbs road salts used Index road salts used	32.23 77	41.74 100
To Convert From To Kilogra Founds (1b) Kilogra Kilogra Metric	ms (kg)	Multiply By 0.454 907.2 0.907

# 6.3.2 Materials Usage

Table 6-19 lists by county the material usage inventory for PSA 3.2. Detailed statistics are shown in Tables 6-12 to 6-31.

Table 6-19 MATERIAL USAGE (in 1972)

	Chemicals Applied To Crops (100 lbs)	Livestock Manure (tons)	Commercial Fertilizer on Cropland (tons)	Limestone Purchased or Applied (tons)	Salts Applied to all Highways (tons)
PSA 3.2 Michigan	(100 103)	(LOHS)	(cono)	(comb)	
Bay	5,562.8	100,835	38,333	1,500	9,140
Clare	389.0	147,885	1,814	3,351	6,408
Genessee	1,476.0	287,319	11,931	4,730	17,892
Gladwin	472.8	162,902	2,330	557	3,495
Gratiot	4,912.9	306,737	39,491	715	3,754
Huron	6,551.0	727,888	55,195	0	3,613
Isabella	2,357.6	421,227	14,915	4,463	4,021
Lapeer	2,682.0	515,092	17,610	4,825	5,394
Midland	1,367.0	123,204	9,062	68	4,445
Saginaw	5,450.1	300,343	48,944	800	9,157
Tuscola	5,825.0	354,522	52,848	1,281	4,592
TOTAL	37,046.2	3,447,954	292,473	22,290	71,909
To Conver	t From	To	The same of the sa	iply By	Name of the Control
Pounds (1	.b)	Kilograms (kg)		. 454	
Tons (ton	1)	Kilograms (kg)	90	07.2	
		Metric Tons		0.907	

# 6.3.2.1 Agricultural Chemicals

There were 1,680,000 kilograms (3,704,620 lbs) of chemicals used in Planning Subarea 3.2. Seventy-nine percent of all chemicals used were herbicides, insecticides 14 percent, and fungicides 7 percent. All of the major field crops and cash crops, except potatoes, are primarily users of herbicides. Chemical usage per harvested acre is almost equal to the Basin average in spite of the very modest use of insecticides and fungicides. It is projected that chemical usage in this subarea may increase 15-20 percent in the next 10 years. Herbicide usage may increase more than this, with insecticide and fungicide usage less.

# 6.3.2.2 Animal Wastes

Livestock production in the subarea will continue but will be largely in those counties not bordering on the Bay. Dairy and cattle, now producing 82 percent of the livestock manure, will be the major types. Manure production rates will continue at about present levels. In 1972 there were 3,127,932 metric tons (3,447,954 tons) of wet manure defecated in this planning subarea. Nitrogen, phosphorus, and potash combined comprise 1.2 percent of the total manure tonnage.

PLANNING AREA: Lake Huron 3.0 STATE: Michigan

PLANNING SUBAREA: Central 3.2

COUNTY: 11 Subarea County Totals

TARTE	1ESTIMATED	AMOINTS	OF	CHEMICALS	HISED	ON	CROPS	1072

	Herbi	cides	Insec	ticides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	434250	11941.8	96500	11/1/7.5		
Grains	165684	828	55228	552.1		
Hay or Grass Silage	68046	680.6	57205	572.0		
Pastured Cropland	40709	407.1	40709	407.1		
Other Field Crops	594487	14904.2		1.652.6	11631	1744.7
Vegetables	13054	645.4	8132	573.5	8429	689.2
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals		29407.5		5201.8	20060	21,33.9

TARLE 2-	MARTITOTZ	TODAM	CLITAIR

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	102069	8831	8670	17501
1969	85884	6934	6836	13770
1972	85610	9100	7700	16800

19/2	05010	AT00	1,000
Wet Manure	Factor: Tons	per litter farro	wed 7,23
Wet Manure	Defecated: To	ms, 1972	121681
Nutrients :	in Wet Manure:	Nitrogen, tons	609
Service Control of the Control of th		Phosphorus, ton	s 169
		Potash, tons	461

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	361220	137295	223925
1969	290298	105283	185015
1972	317400	114400	203000
Wet Manure : Per Anima	Factor: Tons	13.14	6.45
Wet Manure 1		1503216	1309350
	Defecated: Tons, 1972 n Wet Manure: Nitroge	n, tons 15	12566 751
		rus, tons 28	14

# TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	34160	
1969	26832	8609
1972	22100	32324
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	35581	413101
Nutrients in Wet Manure: Nitrogen, Tons	499	2819
Phosphorus, Tons	76	424
Potash, Tons	355	21,78

## TABLE 5-MANURE FROM CHICKENS & TURKEYS

in

Year Item	Chickens	Turkey Hens	Turkeys Raised
964	1610366		
.969 .972	1635820 1568800		
Manure Factor: Lbs. per bird	82.9		
Manure Defecated: Tons, 1972	65026		
trients in Wet Manure: Nitrogen, tons	1014	Combined	
Phosphorus, tons	260		
Phosphorus, tons Potash, tons	228	No	significan

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	4462384	Number I-V farms	10231
Number of farms	16578	Acres in I-V farms	2064078
Acres in farms	2527175	Cropland I-V farms	1697221
Cropland in farms	1992194	Harvested cropland	
Harvested cropland in farms	1469445	I-V farms	1334263

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	2971.67	43521	10589	54110
GRAINS	226510	29768	5.77	30345
Wheat	125463	18201	454	18655
Oats	86545	9810	80	9890
Barley	8231	1150	36	1186
Rye	47.76	427	6	433
OTHER FIELD CROPS	602681	85080	3582	88662
Soybeans	74463	6099	133	6232
Potatoes	11762	6151	103	6254
Sugar beets				
Field beans	5852	25	3	28
HAY OR GRASS SILAGE	187599	3951	45	3996
PASTURED CROPLAND	128317	998	16	1014
Cropland used for pasture	118702	939	1.6	955
Improved pasture	9615	59	0	59 3388
VEGETABLES, SWEET CORN, MELONS	14838	3253	135	3388
ORCHARDS	2251	200	1	201
BERRIES	11119	77	0	77
NURSERY & GREENHOUSE PRODUCTS	1409	678	1	679
OTHER CROPS	1882	231	65	296
Total Fertilizer Used, Tons		167782	15014	182796
Percent of Fertilizer Used		92	8	100

TABLE 7FERTILIZER	USED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	245677	Year	Government Cost/Shared	Government Cost/Shared	Total
Liquid	46796	1972	14905	7385	22290
Total	292473		100 T T T T T T T T T T T T T T T T T T	er Recent Yea	
Primary Nutrients in Fertilizer	143313	101	nages for oth	EL RECEIL AEG	-
Nitrogen	47293				-
Phosphorus	45861				
Potash	50159				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	38562	21,1
1971-72	49494	26.6
1972-73	49577	24.7
Total Estima	ted Tons Applied on All H	Ighways in 1972-73,

	Herbicides	Ins	ecticides	Fungicides	Total
Table 1	29407.5	521	04.8	2433.9	37046.2
Manure: Kind of		Tons	of Materials	in Wet Manure D	efecated
Livesto	k	Manure	Nitrogen	Phosphorus	Potash
Swine: Tab	le 2	121681	609	169	451
Cattle: Ta	ble 3	2812566	15751	2814	14052
Sheep: Tab	le 4	35581	499	7.6	355
Horses: Table 4		413101	2849	414	2477
Chickens:	Table 5	65025	1014	261	228
Turkeys: 7	able 5	-	-	-	-
Total from Tor		3447954	20722	3734	17583
Fertilizers		Tons of		tilizers Applie	d
			Prima	ry Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	292473	47293	45861	50159

Table 8 22290

Salts: Applied on all highways, tons: Table 9 71909

To Convert From

Pounds (1b) Acres (acre) Tons (ton) Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
The second second	Control of the Contro		The second second second				-	

PLANNING AREA: Lake Huron 3.0 STATE: Michigan PLANNING SUBAREA: Central 3.2 COUNTY: Bay

Herbicides		Insecticides		Fungicides	
Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
36830	1,62.8	3710	56.1		
9336	16.7	3112	31.1		
1884	18.8	1570	15.7		
1258	12.6	1258	12.6		· ·
85567	2245.3	11893	931.0		1160.1
3687	179.3	2295	197.7	2380	193.0
2000					
1					
118562	2965.5	23868	12111.2	2022):	1353.1
	Acres Treated 16830 9336 1884 1258 85567	Acres Used Treated 100 lbs  16830 l62.8 9336 l62.7 1881 l8.8 1258 12.6 85567 2215.3 3687 179.3	Acres Used Acres Treated 100 lbs Treated 100 lbs Treated 100 lbs Treated 16830 lb6.7 3112 l881 l8.8 1570 l258 l2.6 1258 85567 22h5.3 11893 3687 179.3 2295	Acres Used Used Treated Used 100 lbs  16830	Acres Used Acres Used Used 100 lbs Treated 100

	Hog & Pig	Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	4573	1,32	1.15	8),7
1969	3026	211	223	434
1972	31.00	300	200	500

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves		
1964	13230	5586	7614		
1969	7308	3001	4307		
1972	8000	3300	14700		
Wet Manure   Per Anima	Factor: Tons	13.14	6,45		
Wet Manure Defecated: Tons, 1972		43362	30315		
	Defecated: Tons, 1972 i Wet Manure: Nitroge Phospho Potash,	n, tons 113 rus, tons 74	7		

TABLE 4-MANURE FROM SHEEP AND HORSES

Sheep & Lambs	Horses & Ponies
162	
269	258
200	1649
1.61	12.78
322	21074
5	145
1	21
3	126
	162 269 200 1,61

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		85351		
1969		1,9208		
1972		51800		
Wet Manure Fac	tor: Lbs. per bird	82.9		
	ecated: Tons, 1972	21/17		
Nutrients in W	et Manure:		Combined	
	Nitrogen, tons	33		
	Phosphorus, tons	9		
	Potash, tons	. 8		-

TABLE 6-- CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres		Number I-V farms	1010
Number of farms	1512	Acres in I-V farms	157933
Acres in farms	185012	Cropland I-V farms	137050
Cropland in farms	1551445	Harvested cropland	
Harvested cropland in fa	arms 128069	I-V farms_	117952

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	8971	1339	613	1952
GRAINS	11.635	1612	19	1631
Wheat	8612	1228	19	72/17
Oats	2382	314	0	33/4
Barley	127	21	0	21
Rye	478	145	0	1,5
OTHER FIELD CROPS	88880	18333	754	19087
Soybeans	2331	268	2	270
Potatoes	7734	4094	66	1:160
Sugar beets				
Field beans	26	0	0	0
HAY OR GRASS SILAGE	4648	117	0	117
PASTURED CROPLAND	3060	48	1	1,9
Cropland used for pasture	2765	36	1	37
Improved pasture	295	12	. 0	12
VEGETABLES, SWEET CORN, MELONS	4002	1052	45	1097
ORCHARDS	0	0	0	0
BERRIES	18	1	0	1
NURSERY & GREENHOUSE PRODUCTS	5	2	0	2
OTHER CROPS	1/11	22	0	22
Total Fertilizer Used, Tons		22526	21/32	23958
Percent of Fertilizer Used		94	6	100

TABLE 7FERTILIZER	USED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENI
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	32200	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	6133	1972	0	1500	1500
Total	38333		nagge for Oth	er Recent Yes	
Primary Nutrients in Fertilizer	18783	101	nages for oth	let mecene rea	-
Nitrogen	6198				
Phosphorus	6011				
Potash	6574				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year Tons Purchased Through State		Tons Applied Per "E" Mile
1970-71	4312	20,6
1971-72	6974	31, 5
1972-73	6301	29.2
Total Estima As Comput	ted Tons Applied on All F	Highways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	ecticides	Fungicides	Total
Table 1	2965.5	12	144.2	1353.1	5562.8
Manure: Ki	nd of	Tons	of Materials	in Wet Manure De	efecated
Livestoc	k	Manure	Nitrogen	Phosphorus	Potash
Swine: Tab	le 2	3615	18	5	14
Cattle: Ta	ble 3	73677	413	74	368
Sheep: Table 4		322	5	1	3
Horses: Table 4		21074	11,5	21	126
Chickens:	Chickens: Table 5		33	9	8
Turkeys: I		0	0	0	0
Total from Livestock, Tons		100835	614	110	519
Fertilizers	11	Tons of	Commercial Fer	rtilizers Applie	d
			Prima	ary Nutrients	
Ite	em .	Total	Nitrogen	Phosphorus	Potasi
Applied on Table 7	Cropland:	38333	6198	6011	6574

To Convert From

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 9110

PLANNING AREA:	Take Huron 3.0	STATE:	Michigan
DI ANNITHO CHEADEA.	7 1 7 7 7	COINTY.	Claus

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972	

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	7110	195.5	1580	23.7		
Grains	2790	12.3	820	8.2		
Hay or Grass Silage	1176	41.8	31/80	34.8		
Pastured Cropland	3646	36.5	3646	36.5		
Other Field Crops						
Vegetables						
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	17392	286.1	9526	103.2	26918	389.3

## TABLE 2-MANURE FROM SWINE

	Hog & Pig		s Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	2670	260	262	522
1969	2802	216	237	153
1972	2900	300	300	600
Wet Manu	re Defecated:	re: Nitrogen, to	0ns 14338	
		Phosphorus,	tons 6	

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	15218	5629	9589			
1969	12451	11404	801,7			
1972	13600	4800	8800			
Wet Manure Per Anima	Factor: Tons	13.14	6.45			
Wet Manure Defecated: Tons, 1972		63072	56760			
		rogen, tons 6	19832 71 20			

# TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	4047	200
1969	4665	301 1342
1972	4000	1342
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	611/10	17151
Nutrients in Wet Manure: Nitrogen, Tons	90	118
Phosphorus, Tons	3/4	17
Potash, Tons	64	103

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	26079		
1969	3338		
1972	3000		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	124		
Nutrients in Wet Manure: Nitrogen, tons	2	Combined	
Phosphorus, tons Potash, tons	1 0		-

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	1) 365376	Number I-V farms	219
Number of farms	30),	Acres in I-V farms	64984
Acres in farms	89013	Cropland I-V farms	33902
Cropland in farms	113857	Harvested cropland	
Harvested cropland in far	ms 2301/8	I-V farms	19003

	Crop	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	Total
CORN	1,329	540	109	649
GRAINS	3392	333	1	334
Wheat	740	88	1	89
Oats	2430	226	0	226
Barley	26	14 8	0	1
Rye	1117		0	8
OTHER FIELD CROPS	171	22	0	22
Soybeans				
Potatoes	14	1	0 -	1
Sugar beets				
Field beans	1.77	0	0	0
HAY OR GRASS SILAGE	1.0995	73	0	73
PASTURED CROPLAND	12814	53	2	55
Cropland used for pasture	10980	53	2	55 55
Improved pasture	1834	0	0	0
VEGETABLES, SWEET CORN, MELONS	0	0	0	0
ORCHARDS	3	0	0	0
BERRIES	0	0	0	0
NURSERY & GREENHOUSE PRODUCTS	15	1	0	1
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		1022	112	1134
Percent of Fertilizer Used		90	10	100

# TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

		APPLIED				
Item	Tons		Tonnage	Tonnage not	-	
Fertilizer Used on Crops: Solid	1524	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	290	1972	2890	1,61	3351	
Total	1814			er Recent Years		
Primary Nutrients in Fertilizer	889	101	nages tot oc	THE CONTRACTOR	-	
Nitrogen	293					
Phosphorus	284					
Potash	312					

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year Tons Purchased Through State		Tons Applied Per "E" Mile	
1970-71	3310	21.3	
1971-72	11191	29,1	
1972-73	lili16	26.8	
Total Estima As Comput	ted Tons Applied on All	Highways in 1972-73,	

#### TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	-	secticides	Fungicides	Total
Table 1	286.1		103.2		389.3
Manure: Kind of Livestock		Tons	of Materials	in Wet Manure De	
		Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2		14338	22	6	16
Cattle: Table 3		119832	671	120	599
Sheep: Table 4		61,40	90	1/1	611
Horses: Table 4		17151	118	1.7	103
Chickens: Table 5		224	2	1	0
	urkeys: Table 5		0	0	0
Total from Livestock, Tons		147885	903	158	782
Fertilizer	s:	Tons of		rtilizers Applied	d
		Primary Nutrients			
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	1814	293	284	312
Lime: Lim	estone equiva	lent purcha	sed or applied	d, tons:	

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
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PLANNING AREA: Jake Huron 3.0	STATE: Michigan	
DI ANNING SURADRA. Central 2 2	COUNTY: Coroses	

TABLE I	-ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS	1972

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	29310	806.8	6520	97.8		
Grains	9906	10.5	3302	33.0		
Hay or Grass Silage	5366	53.7	11/72	11.7		
Pastured Cropland	21472	24.7	2472	24.7	_	
Other Field Crops	13758	286.9	837	8.4		
Vegetables	360	8.0	2/18	31.4	353	6.8
Orchards					-	
Berries						
Nursery, Greenhouse						-
Other Crops						
Totals	61202	1229.6	17851	210.0	353	6-8
Total Herbicides, In					791/06	11/26-1

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	8233	739	689	1/428
1969	7153	487	1,30	917
1972	7400	600	500	13.00

1972 7400	600	500 13.00
Wet Manure Factor: Ton	s per litter farrowed	7.23
Wet Manure Defecated: T	ons, 1972	7953
Nutrients in Wet Manure	: Nitrogen, tons	40
	Phosphorus, tons	11
	Potash, tons	30

## TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	27583	10078	17505		
1969 1972	20495 22400	6600	14389		
Wet Manure I Per Animal	actor: Tons	13.14	6.45		
Wet Manure I		86724	101910		
	Defecated: Tons, 1972 Wet Manure: Nitroge		3631		
NULLICITES II		rus, tons 189			

#### TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	7602	
1969	1832 1000	1172
1972	4000	6329
Wet Manure Factor: Tons per anima	1 1.61	12.78
Wet Manure Defecated: Tons, 1972	61010	80885
Nutrients in Wet Manure: Nitrogen	Tons 90	558
Phosphor	us, Tons li	81
Potash,	Tons 6h	485

### TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	82948		
1969	71400		
1972	82200		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	31,07		
Nutrients in Wet Manure: Nitrogen, tons	53	Combined	
Phosphorus, tons	2/4		
Potash, tons	12		

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, ac	res 1,10880 (1)	Number I-V farms 604
Number of farms	1360	Acres in I-V farms 122hlh
Acres in farms	170931	Cropland I-V farms 9883h
Cropland in farms	132009	Harvested cropland
Harvested cropland in	farms 82518	I-V farms 68625

	Crop	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total	
CORN	23197	3192	769	3967	
GRAINS	1557,7	1797	37	7.831	
Wheat	8990	1123	29	1152	
Oats	5906	613	8	621	
Barley	90	11	0	16	
Rye	254	16	0		
OTHER FIELD CROPS	14245	1078	26	1104	
Soybeans	11264	737	9	7146	
Potatoes	117	61	0	61.	
Sugar beets					
Field beans	504	13	0	13	
HAY OR GRASS SILAGE	1446	182	0	182	
PASTURED CROPLAND	7457	80	0	80	
Cropland used for pasture	7177	80	0	80	
Improved pasture	280	0	0	0	
VEGETABLES, SWEET CORN, MELONS	11914	88	1	89	
ORCHARDS	725	59	0	59	
BERRIES	136	32	0	32	
NURSERY & GREENHOUSE PRODUCTS	306	103	0	103	
OTHER CROPS	20	0	0	0	
Total Fertilizer Used, Tons		6624	833	7457	
Percent of Fertilizer Used	Comments of the last of the la	89	11	100	

#### TABLE 7-FERTILIZER USED IN 1972 T

TABLE / FERTILIZER USED IN 19		APPLIED					
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	10022	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid Total	1909 11931	1972	3230	1500	1,730		
Primary Nutrients in Fertilizer	5846	Ton	inages for Oth	er Recent Yea			
Nitrogen Phosphorus	1929						
Parach	2016						

## TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	957),	27.8
1971-72	957h 12058	35.1
1972-73	12336	33.6
	ted Tons Applied on All Hi ed 17892	ghways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbicio	les	Insec	ticides	Fungicides	Total
Table 1 1229.6		240.	)	6.8	1476.4
Manure: Kind of		Tons o	f Materials	in Wet Manure De	efecated
Livestock	Man	nure	Nitrogen	Phosphorus	Potash
Swine: Table 2	7953		40	11	30
Cattle: Table 3	1886	34	1056	189	943
Sheep: Table 4	61410		90	14	64
Horses: Table 4	8088	5	558	81	485
Chickens: Table 5	3407		53	14	12
Turkeys: Table 5	0		0	0	0
Total from Livestock, Tons	2873	19	1797	309	1534
Fertilizers:	Tons	of Co	mmercial Fer	tilizers Applied	i
			Prima	ry Nutrients	
Item	Tota	1	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	1193	1	1929	1671	2046

Salts: Applied on all highways, tons: Table 9 17892

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ba) Kilograms (kg) Multiply By 0.453 .4047 907.2

#### GREAT LAKES BASIN MATERIAL USAGE INVENTORY

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Huron 3.0

STATE: Michigan

PLANNING SUBAREA: Central 3.2

COUNTY: Gladwin

			icides	Punga	cides
Acres Treated	Amount Used 100 lbs	Acres	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
7200	198.0	1600	24.0		
2676	13.4	892	8.9		
4784	47.8	3986	39.9		
4194	41.9	4194	41.9		
2231	55.8	119	1.2		
1					
01000	07/ 0	10001	335.0		
	7200 2676 4784 4194 2231	Treated 100 lbs 7200 198.0 2676 13.4 4784 47.8 4194 44.9 2231 55.8	Treated 100 lbs Treated 7200 198.0 1600 2676 13.4 892 4784 47.8 3986 4194 41.9 4194 2231 55.8 119	Treated 100 lbs Treated 100 lbs 7200 198.0 1600 24.0 2676 13.4 892 8.9 4784 47.8 3986 39.9 4194 41.9 41.9	Treated 100 lbs Treated 100 lbs Treated  7200 198.0 1600 24.0 2676 13.4 892 8.9 4784 47.8 3986 39.9 4194 41.9 41.9 2231 55.8 119 1.2  21085 356.9 10791 115.9

TABLE	2MANURE	FROM	SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	3216	340	340	680
1969	2278	211	179	390
1972	2300	300	200	500

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 3615
Nutrients in Wet Manure: Nitrogen, tons 18
Phosphorus, tons 5
Potash, tons 14

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	17966	6019	11947		
1969	13760	5260	8500		
1972	15100	5700	9400		
Wet Manure Per Anim	Factor: Tons	13.14	6.45		
Wet Manure Tons, 19	Defecated:	74898	60630		
Wet Manure	Defecated: Tons, 1972 in Wet Manure: Nitrog Phosph	Combined: 135528	50030		

## TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2996	
1969	2968	359
1972	2400	1547
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	3864	19771
Nutrients in Wet Manure: Nitrogen, Tons	54	136
Phosphorus, Tons	8	20
Potash, Tons	39	119

#### TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	13490		
1969	2978		
1972	3000		
Wet Manure Factor: Lbs. per b	ird 82.9		
Wet Manure Defecated: Tons, 1	972 124		
Nutrients in Wet Manure: Nitrogen, ton	100	Combined	
Phosphorus, t Potash, tons	ons 0		7

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 322176 (1)	Number I-V farms 253
Number of farms 507	Acres in I-V farms 61328
Acres in farms 91491	Cropland I-V farms 40148
Cropland in farms 50209	Harvested cropland
Harvested cropland in farms 20065	I-V farms 22330

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	5107	652	40	692
GRAINS	4122	382	0	382
Wheat	1140	116	0	116
Oats	2813	253	0	253
Barley	25	3	0	3
Rye	62	2	0.	5
OTHER FIELD CROPS	1768	268	0	268
Sovbeans	65	10	0	10
Potatoes	3	1	0	1
Sugar beets				
Field beans	230	2	0	2
HAY OR GRASS SILAGE	11339	78	0	78
PASTURED CROPLAND	12186	34	0	34
Cropland used for pasture	11166	28	0	28
Improved pasture	1020	6	0	6
VEGETABLES, SWEET CORN, MELONS	27	0	0	0
ORCHARDS	2	0	0	0
BERRIES				
NURSERY & GREENHOUSE PRODUCTS	10	0	0	0
OTHER CROPS				
Total Fertilizer Used, Tons		1416	40	1456
Percent of Fertilizer Used		97	3	100

#### TAE

			APPLIED		
Item	Tons	-	Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	1957	Year	Government Cost/Shared	Cost/Shared	Total Tonnage
Liquid	373	1972	557	0	557
Total	2330	Ton		er Recent Yes	
Primary Nutrients in Fertilizer	1142	100	and the second		-
Nitrogen	377				
Phosphorus	365				
Potash	400				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1882	20.5
1971-72	3080	33.8
1972-73	2410	24.8
Total Esti As Comp	mated Tons Applied on All Hi uted 3495	ghways in 1972-73,

#### TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide 356.9	Ins	secticides .9	Fungicides -	472.8
Manure: K	ind of	Tons		ls in Wet Manure I en Phosphorus	Potash
Swine: Ta		3615	18	5	14
Cattle: T		135528	759	136	678
Sheep: Ta		3864	54	8	39
Horses: T		19771	136	20	119
Chickens:		1,24	2	0	0
Turkeys:		0	0	0	0
Total from Livestock, Tons		162902	969	169	850
Fertilizer	19:	Tons of		Fertilizers Applie	ed
It	em	Total	Nitrogen	Phosphorus	Potash
	Company of the Compan	The second second second			

Fertilizers:	Tons of	Primary Nutrients			
Item	Total	Nitrogen	Phosphorus	Potash	
Applied on Cropland: Table 7	2330	377	365	400	

Lime: Limestone equivalent purchased or applied, tons: Table 8 557 Salts: Applied on all highways, tons: Table 9 3495

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: Michigan PLANNING AREA: Lake Huron 3.0

PLANNING SUBAREA: Central 3.2

COUNTY: Gratiot

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	65070	1789.4	14460	21.6.9		
Grains	18756	93.8	6252	62.5		
Hay or Grass Silage	3748	37.5	3123	31.2		
Pastured Cropland	2738	27.4	2738	27.4	4	
Other Field Crops	88331	2135.9	5340	109.2	532	79.8
Vegetables	2415	144.9	1208	36.2	1208	120.8
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	181058	4228.9	33121	483.4	1740	200.6
Total Herbicides, In	secticide	s, Fungio	ides: 10	00 1bs	215919	4912.9

TABLE 2-MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	19194	1712	1527	3239
1969	16909	1291	1238	2529
1972	17400	1700	1400	3100

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 22630
Nutrients in Wet Manure: Nitrogen, tons 113
Phosphorus, tons 32 Potash, tons 86

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves
1964	32822	10076	22746
1969	27231	7755	19476
1972	29800	8400	21400
Wet Manure Per Anim	Factor: Tons	13.14	6.45
Wet Manure Tons, 19	Defecated: 72	110376	138030
	Defecated: Tons, 19		6

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	5152	
1969	3275	702
1972	2600	1,998
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	4186	25534
Nutrients in Wet Manure: Nitrogen, Tons	59	176
Phosphorus, Tons	9	26
Potash, Tons	42	153

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	193295		
1969	142473		
1972	144300		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	5981		
Nutrients in Wet Manure: Nitrogen, tons		Combined	111 3401
Phosphorus, tons	93 24	-	
Potash, tons	21		1 10 10

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 391920 (1) Number I-V farms 1292

Acres in I-V farms 261373

Cropland I-V farms 221385 Number of farms 1935 Acres in farms 301873 Cropland in farms 248055
Harvested cropland in farms 191626 Harvested cropland
I-V farms 177990

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	44466	6808	2054	8862
GRAINS	22217	2783	44	2827
Wheat	13069	1.889	37	1926
Oats	8385	837	5	842
Barley	80	8		8
Rye	585	40	0	40
OTHER FIELD CROPS	98306	11544	515	12059
Soybeans	17444	1511	22	1533
Potatoes	532	249	20	269
Sugar beets				
Field beans	329	0	3	3
HAY OR GRASS SILAGE	10801	363	3	366
PASTURED CROPLAND	10150	75	0	75
Cropland used for pasture	9121	70	0	70
Improved pasture	1029	5	0	
VEGETABLES, SWEET CORN, MELONS	2206	368	26	394
ORCHARDS	9	0	0	0
BERRIES	11.	1	0	1
NURSERY & GREENHOUSE PRODUCTS	32	67	0	3
OTHER CROPS	515	67	25	92
Total Fertilizer Used, Tons		22012	2670	24682
Percent of Fertilizer Used		89	11	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

			APPLIED			
Item	Tons		Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	33172	Year	Government Cost/Shared	Government Cost/Shared	Total	
Liquid	6319	1972	265	450	715	
Total	39491	Tonnages for Other Recent Years				
Primary Nutrients in		100	mages rer cer	10.0000		
Fertilizer	19351					
Nitrogen	6386				-	
Phosphorus	6192					
Potash	6773					

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1952	15.8
1971-72	2468	19.3
1972-73	2588	19.0
	mated Tons Applied on Al uted 3754	1 Highways in 1972-73,

TABLE 10 SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbici	des	Insecticides	Fungicides	Total
Table 1 4228.9		483.4	200.6	4912.9
Manure: Kind of		Tons of Materia	als in Wet Manure	
Livestock	Ma	nure Nitro	gen Phosphoru	
Swine: Table 2	22630	113	32	86
Cattle: Table 3	248406	1391	248	1242
Sheep: Table 4	4186	59	9	42
Horses: Table 4	25534	176	26	153
Chickens: Table 5	5981	93	24	21
Turkeys: Table 5	0	0	0	0
Total from Livestock, Tons	306737	1832	339	1544
Fertilizers:	Tons	of Commercial	Fertilizers Appl	lied
		P	rimary Nutrients	
Item	Tota	1 Nitroger	a Phosphorus	Potasi
Applied on Cropland: Table 7	39491	6386	6192	6773

To Convert From Pounds (1b)

Kilograms (kg) Hectare (ha) Acres (acre) Tons (ton) Kilograms (kg) Multiply By 0.453 907.2

Salts: Applied on all highways, tons: Table 9 3754

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Huron 3.0 STATE: Michigan

PLANNING SUBAREA: Central 3.2

COUNTY: Huron

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	95940	2638.4	21320	319.8		
Grains	39072	195.4	13024	130.2		
Hay or Grass Silage	13100	131.0	10917	109.2		
Pastured Cropland	6855	68.6	6855	68.6		
Other Field Crops	107235	2754.5	5825	77.1	179	26.8
Vegetables	230	13.8	115	3.4	171	14.8
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	262432	5801.7	58056	708.3	350	41.6

	TABLE	2MAN	URE	FROM	SWINE
--	-------	------	-----	------	-------

	Hog & Pig	Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	13462	972	1122	2094
1969	12916	1045	1076	2121
1972	13300	1400	1200	2600

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 18798
Nutrients in Wet Manure: Nitrogen, tons 94
Phosphorus, tons 26
Potash, tons 71

		Number Cattle	Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	78645	26944	51701				
1969	68594	23632	44962				
1972	75000	25700	49300				
Wet Manure Per Anima	Factor: Tons	13.14	6,45				
Wet Manure Tons, 197	Defecated:	337698	317985				

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1031	
1969	673	721
1972	500	1951
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	805	24934
Nutrients in Wet Manure: Nitrogen, Tons	11	172
Phosphorus, Tons	2	25 150
Potash, Tons	8	150

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Ite	m	Chickens	Turkey Hens	Turkeys Raised
1964		575005		
1969		783556		
1972		667500		
Wet Manure Factor: Lbs. p	er bird	82.9		
wet Manure Defecated: Ton	s, 1972	27668		
Nutrients in Wet Manure: Nitrogen, tons		432	Combined	
Phosphoru		111		
Potash, t		97	And and the last	

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

Number I-V farms 1834				
Acres in I-V farms 376787				
Cropland I-V farms 325669				
Harvested cropland				
I-V farms 257884				

	Crop	Tons of Fertilizer Us			
Crops	Acres	Dry	Liquid	Tota	
CORN	62323	10061	2447	12508	
GRAINS	49091	6915	104	7019	
Wheat	28373	4454	85	4539	
Oats	19153	2282	19	2301	
Barley	1117	140		140	
Rye	335	24	0	24	
OTHER FIELD CROPS	106248	13058	485	13543	
Soybeans	2709	175	45	550	
Potatoes	179	97	0	97	
Sugar beets					
Field beans	1560	3	0	3	
HAY OR GRASS SILAGE	38524	1076	2	1078	
PASTURED CROPLAND	23771	259	0	259	
Cropland used for pasture	23035	237	0	237	
Improved pasture	736	22	0	22	
VEGETABLES, SWEET CORN, MELONS	1438	81	0	81	
ORCHARDS	25	2	0	2	
BERRIES	0	0	0	0	
NURSERY & GREENHOUSE PRODUCTS	8	2	0	2	
OTHER CROPS	76	2	0	2	
Total Fertilizer Used, Tons		31459	3038	34497	
Percent of Fertilizer Used		91	9	100	

# TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

		APPLIED						
Item	Tons		Tonnage	Tonnage not				
Fertilizer Used on Crops: Solid	46364	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage			
Liquid	8831	1972	0	0	0			
Total	55195		magaz For Oth	er Recent Yea	re			
Primary Nutrients in Fertilizer	27046	101	mages for our	er wedent rea	*			
Nitrogen	8925							
Phosphorus	8655							
Potash	9466							

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	1827	10.8
1971-72	2082	12.3
1972-73	2491	13.8
Total Esti	mated Tons Applied on All Hi	ghways in 1972-73,

# TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbi	cides	In	secticides	Fungicides	Total
Table 1 5801.7		708		41.6	6551.6
Manure: Kind of		Ton	s of Materia	ls in Wet Manure	Defecated
Livestock		Manur	e Nitrog	en Phosphorus	s Potash
Swine: Table 2	18	798	9li	26	71
Cattle: Table 3	65	5683	3672	656	3278
Sheep: Table 4	80	5	11	2	8
Horses: Table 4	24	934	172	25	150
Chickens: Table 5	27	668	432	111	97
Turkeys: Table 5	0		0	0	0
Total from Livestoc Tons		7888	4381	820	3604
Fertilizers:	1	ons of		Fertilizers Appl:	ied
			Pr	imary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on Cropland Table 7	551	.95	8925	8655	9466

Table 8 0

Salts: Applied on all highways, tons: Table 9 3613

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Corn Grains

Crop Group

Berries Nursery, Greenhouse Other Crops

Crops

TABLE 2--MANURE FROM SWINE

Hog & Pig Inventory Dec. 1

14375

# GREAT LAKES BASIN MATERIAL USAGE INVENTORY

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds

STATE: Michigan PLANNING AREA: Lake Huron 3.0 COUNTY: Isabella

PLANNING SUBAREA: Central 3.2

Fungicides Amount Used

Treated 100 lbs

Total

2698

1900

Acres

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

1378,6 11140

756 400

Number Sows Farrowing
Dec. 1-May 31 June 1-Nov. 30

Fall

13737

69

19 52

1328

744

800

Insecticides

Treated 100 lbs

Acres

Amount Used

167.1

167.1 44.5 72.6 53.9 7.6 18.9

Herbicides Amount

Treated

50130 13356

Used

81.2 53.9 349.3

28.9

 Totals
 91904
 1958.7
 29404
 364.6
 514

 Total Herbicides, Insecticides, Fungicides:
 100 lbs
 1216

Spring

Phosphorus, tons Potash, tons

1370

1100

Wet Manure Factor: Tons per litter farrowed\_ Wet Manure Defecated: Tons, 1972

Nutrients in Wet Manure: Nitrogen, tons

100 lbs

CABLE	6CROP	ACREAGES	&	FERTILIZER	USED-CLASS	I-V	CENSUS	FARMS,	1969	
			_							

COUNTY, land area, acres (1	365888	Number I-V farms	750
Number of farms	1270	Acres in I-V farms	164308
Acres in farms	208663	Cropland I-V farms	127895
Cropland in farms	157624	Harvested cropland	
Harvested cropland in farm	s 103111	I-V farms_	90314

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	35227	4623	844	5467
GRAINS	14821	1538	10	1548
Wheat	5825	659	5	564
Oats	8458	832	- 5	837
Barley	61	11	0	11
Rye	402	24	0	24
OTHER FIELD CROPS	15105	1463	15	1478
Soybeans	1232	74	0	74
Potatoes	7	3	0	3
Sugar beets				
Field beans	1722	5	0	5
HAY OR GRASS SILAGE	23232	451	7	458
PASTURED CROPLAND	18577	134	0.	134
Cropland used for pasture	16721	130	0	130
Improved pasture	1856	4	0	4
VEGETABLES, SWEET CORN, MELONS	728	163	12	175
ORCHARDS	88	18	0	18
BERRIES	14	5	0	5
NURSERY & GREENHOUSE PRODUCTS	5	1	0	1
OTHER CROPS	102	31.	2	33
Total Fertilizer Used, Tons		8432	890	9322
Percent of Fertilizer Used		90	10	100

TABLE 7I	ERTILIZER US	SED IN	1972	TABLE	8GROUND	LIMESTONE	EQUIVALENT
			-000		APPLIE	)	

		TOTAL SE	APPLIED						
Item	Tons		Tonnage	Tonnage not					
Fertilizer Used on Crops: Solid	12529	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage				
Liquid	2386	1972	4049	414	4463				
Total	14915	Tonnages for Other Recent Years							
Primary Nutrients in Fertilizer	7308	100	nages for oth	ler Necent 168	-				
Nitrogen	2412								
Phosphorus	2339								
Potash	2557								

Year Total	Number Cattle	and Calves	
	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves	
1964	47959	16439	31520
1969	39358	12708	26650
1972	43000	13800	29200
Wet Manure Per Anima	Factor: Tons	13,14	6,45
Wet Manure Tons, 197		181332	188340
	Defecated: Tons, n Wet Manure: Ni	trogen, tons 207	0
		otash, tons 370	

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2181	21.2
1971-72	2235	21.9
1972-73	2772	25.5
Total Estima As Comput	ted Tons Applied on All Hi	ghways in 1972-73,

TABLE 4MANURE FROM SHEEP AND HORSES		
Year Item	Sheep & Lambs	Horses & Ponies
1964	3222	
1969	1960	7.36
1972	1600	2612
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2576	33381
Nutrients in Wet Manure: Nitrogen, Tons	36	230
Phosphorus, Tons	5	33
Potash, Tons	26	200

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Inse	ecticides	Fungicides	Total
Table 1	1958.7	364	.6	34.3	2357.6
Manure: Kind of		Tons	of Materials	in Wet Manure De	
Livestoc		Manure	Nitrogen	Phosphorus	Potash
Swine: Tab	le 2	13737	69	19	52
Cattle: Ta	ble 3	369672	2070	370	1891
Sheep: Tab	le 4	2576	36	5	26
Horses: Ta		33381	230	33	200
Chickens:	Table 5	1861 29		7	7
Turkeys: T	able 5	0	0	0	0
Total from Ton		421227	2434	434	213
Fertilizers	1	Tons of	Commercial Fer	tilizers Applie	d
			Prima	ry Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	14915	2412	2339	2557

TABLE	5MANURE	FROM	CHICKENS	å	TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	91889		
1969	40804		
1972	44900		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	1861		
Nutrients in Wet Manure: Nitrogen, tons	29	Combined	
Phosphorus, tons	7		
Potash, tons	7	The last of the	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Salts: Applied on all highways, tons: Table 9 4021

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Huron 3.0

STATE: Michigan COUNTY: Lapeer

PLANNING SUBAREA: Central 3.2

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	46710	1284.5	10380	155.7		
Grains	12666	63.3	4222	42.2		
Hay or Grass Silage	12249	1225	10208	102.1		
Pastured Cropland	5762	57.6	5762	57.6		
Other Field Crops	7956	200.7	1312	110.6	929	139.4
Vegetables	1727	60.3	1708	168.3	1320	117.2
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	87070	1788.9	33592	636.5	2249	256.6
Total Herbicides, In	secticide	s. Fungio		0 1bs	122911	2682.0

TARYP	2	-MANURE	MODE	CLITNIP
LABLE	12-	-MANUKE	PROFI	SWIME

	Hog & Pig	Number Son	ws Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
964	7642	687	689	1375	
969	8450	762	751	1513	
1972	8700	1000	800	1800	

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972 13014
Nutrients in Wet Manure: Nitrogen, tons 65
Phosphorus, tons 18
Potash, tons 49

	Total	Cows & Heifers Calved	Heifers, Steers
1964 40			Bulls, Calves
	1421	22969	26452
1969 40	959	17866	23093
	1800	19400	25400
Wet Manure Factor Per Animal	: Tons	13,14	6.45
Wet Manure Defecated: Tons, 1972		254916	163830

Potash, tons 2094

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	4824	
1969	4245	1866
1972	3500	5848
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	5635	74737
Nutrients in Wet Manure: Nitrogen, Tons	79	516
Phosphorus, Tons	12	75
Potash, Tons	46	448

## TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys
1964		92313		
1969		64734		
1972		71400		
Wet Manure Fac	tor: Lbs. per bird	82.9		
wet Manure Def	ecated: Tons, 1972	2960		
Nutrients in W	et Manure:		Combined	
	Nitrogen, tons	46		
	Phosphorus, tons	12		
	Potash, tons	10		

#### OP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acr	es <sup>(1)</sup> 420854	Number I-V farms 840
Number of farms	1719	Acres in I-V farms 179370
Acres in farms	245956	Cropland I-V farms 138358
Cropland in farms	179988	Harvested cropland
Harvested cropland in	farms 110835	I-V farms 95231

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	33684	4688	884	5572
GRAINS	16744	2092	40	2132
Wheat	7113	956	24	980
Oats	8437	974	12	986
Barley	218	30	0	30
Rye	494	65	4	69
OTHER FIELD CROPS	7468	1328	g	1337
Soybeans	351	43	0	43
Potatoes	929	419	6	425
Sugar beets				
Field beans	561	1	0	1
HAY OR GRASS SILAGE	33203	526	10	536
PASTURED CROPLAND	17907	73	9	82
Cropland used for pasture	16452	66	9	7.5
Improved pasture	1455	7	0	7
VEGETABLES, SWEET CORN, MELONS	2152	689	0	689
ORCHARDS	932	85	0	85
BERRIES	118	16	0	16
NURSERY & GREENHOUSE PRODUCTS	926	543	0	543
OTHER CROPS	62	1.3	0	13
Total Fertilizer Used, Tons		10054	952	11006
Percent of Fertilizer Used		91	9	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

ELIMINA I AMAN III			APPLIED						
Item	Tons		Tonnage	Tonnage not	-				
Fertilizer Used on Crops: Solid	14792	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage				
Liquid	2818	1972	3155	1670	4825				
Total	17610			er Recent Yes					
Primary Nutrients in Fertilizer	8629	400	mages for ver						
Nitrogen	2848			-					
Phosphorus	2761								
Potach	3020								

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Through State	"E" Mile
2881	26,4
3474	29.7
3719	29.8
	288 <b>1</b> 3474

### TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	secticides	Fungicides	Total
Table 1 1788.9		63	6.5	256.5	2682.0
Manure: Ki	nd of	Tons	s of Material	s in Wet Manure D	efecated
Livestoc		Manure	e Nitroge	n Phosphorus	Potash
Swine: Tab		13014	65	18	49
Cattle: Ta		418746	2345	419	2094
Sheep: Tab		5635	79	12	56
Horses: Ta		74737	51.6	75	448
Chickens: Table 5 Turkeys: Table 5		2960	46	12	10
		0	0	9	0
Total from Ton	Livestock,	515092	3051	536	2657
Fertilizers	:	Tons of		ertilizers Applie	đ
			Pri	mary Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	17610	2848	2761	3020

Table 8 4825

Salts: Applied on all highways, tons: Table 9 5394

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: MICHIGAN PLANNING AREA: LAKE HURON 3.0

PLANNING SUBAREA: CENTRAL 3.2

COUNTY: MIDLAND

TABLE	1ESTIMATED	AMOUNTS.	OF	CHEMICALS	USED	ON	CROPS.	1972	

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	15480	425.7	3440	51.6		
Grains	4050	20.2	1350	13.5		
Hay or Grass Silage	1898	19.0	1582	15.8		
Pastured Cropland	1378	13.8	1378	13.8	man.	
Other Field Crops	27166	668.1	1665	37.9	203	30.4
Vegetables	460	27.6	230	6.9	530	23.0
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals Total Herbicides, In	50432	1174.4		139.5	433	53.4

MARKE S MANIBE PROM CUINE

	Hog & Pig	Number Son	ws Farrowing	
ear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	5.758	595	538	1133
969	3617	317	310	627
972	3700	400	400	800

| Wet Manure Factor: Tons per litter farrowed | 7.23 | Wet Manure Defecated: Tons, 1972 | 5784 | Nutrients in Wet Manure: Nitrogen, tons | 29 | Phosphorus, tons | 8 | Potash, tons | 22 |

		Cows & Heifers	Heifers, Steers
Year	Total	Calved	Bulls, Calves
1964	11206	3571	7635
1969	8709	2743	5966
1972	9500	3000	6500
Wet Manure Fac Per Animal	ctor: Tons	13.14	6.45
Wet Manure Der Tons, 1972	fecated:	39420	41925

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1127	
1969	353	582
1972	300	2588
Wet Manure Factor: Tons per animal	1.61	12,78
Wet Manure Defecated: Tons, 1972	483	34353
Nutrients in Wet Manure: Nitrogen, Tons	7	237
Phosphorus, Tons	1	314
Potash, Tons	5	206

TARLE S .\_ MANUER FROM CUTCHENG & THEFT

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	59823		
1969	27423		
1972	29900		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	1239		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	19		
Phosphorus, tons	5		
Potash, tons	14		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area,	acres 332736	Number I-V farms	377
Number of farms	712	Acres in I-V farms	74835
Acres in farms	101017	Cropland I-V farms	57985
Cropland in farms	72323	Harvested cropland	
Harvested cropland	in farms 51244	I-V farms	44559

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	9341	1240	377	1617
GRAINS	4002	463	6	469
Wheat	1889	240	3	243
Oats	1895	210	3	213
Barley	51	3	0	3
Rye	153	10	0	10
OTHER FIELD CROPS	26385	3128	193	3321
Soybeans	2789	229	22	251
Potatoes	203	11.7	10	127
Sugar beets				
Field beans	43	0	0	0
HAY OR GRASS SILAGE	4401	75	0	75
PASTURED CROPLAND	3433	34	0	34
Cropland used for pasture	3338	34	0	34
Improved pasture	95	D	0	0
VEGETABLES, SWEET CORN, MELONS	377	107	5	112
ORCHARDS				
BERRIES	5	0	0	0.
NURSERY & GREENHOUSE PRODUCTS	1	0	0	0
OTHER CROPS	233	30	6	36
Total Fertilizer Used, Tons		5077	587	5664
Percent of Fertilizer Used		90	10	100

TABLE 7-FERTILIZER USED IN 1972		TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	7612	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1450	1972	68	0	68
Total	9062			er Recent Yea	irs
Primary Nutrients in Fertilizer	4440	101	mages for our	IEI MCCOIL SCO	-
Nitrogen	1465				-
Phosphorus	1421				
Potagh	15511				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	3256	32.2
1971-72	3315	33.0
1972-73	3065	28.6
Total Estima	ited Tons Applied on All Hi	ghways in 1972-73,
As Comput		guwaya in interior

OF ACRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	secticides	Fungicides	Total
Table 1	1174.4	1	39.5	53.4	1367.3
Manure: Kind	of	Tons	of Materials	in Wet Manure D	
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Table	2	5784	29	8	22
Cattle: Table	3 3	81345	456	81	407
Sheep: Table	4	483	7	1	5
Horses: Table		34353	237	34	205
Chickens: Tal	ole 5	1239	19	5	4
Turkeys: Tab	le 5	0			
Total from Li Tons	vestock,	123204	748	129	644
Fertilizers:		Tons of		rtilizers Applie	d
				ary Nutrients	1 -
Item		Total	Nitrogen	Phosphorus	Potasi
Applied on Cr	opland:	9062	1465	1421	1554

Table 8 68

Salts: Applied on all highways, tons: Table 9\_ 4445

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Huron 3.0 STATE: Michigan
PLANNING SUBAREA: Central 3.2 COUNTY: Saginaw

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

THE REAL PROPERTY.	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	38520	1059.3	8560	128.4		
Grains	20436	102.2	6812	68.1		
Hay or Grass Silage	4977	49.8	4147	41.4		
Pastured Cropland	2310	23.1	2310	23.1		
Other Field Crops	138797	3386.2	8244	149.4	637	95.6
Vegetables	2270	113.6	1353	93.5	1597	116.9
Orchards						
Berries						
Nursery, Greenhouse	red tes					
Other Crops						
25- x - 1 -	207310	4734.2	31426	503.9	2234	212.5
Totals Total Herbicides, In		1. 7.1.30	00.000	0 1bs	240970	

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	13001	1089	1072	2161
1969	12084	874	1054	1928
1972	12400	1100	1200	2300

Wet Manure Factor: Tons	per litter farrowed	7,23
Wet Manure Defecated: Ton	s, 1972	16629
Nutrients in Wet Manure:	Nitrogen, tons	83
	Phosphorus, tons	23
	Potash, tons	63

## TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves	
1964	30000	13403	16597	
1969	23097	9977	13120	
1972	25200	10800	14400	
Wet Manure F Per Animal	actor: Tons	13.14	6.45	
Wet Manure I Tons, 1972	NOTE TO BE SEED OF THE SEED OF	141912	92880	
	Defecated: Tons, 1972 Wet Manure: Nitroge	n, tons 1315	92	
	Phospho Potash,	tons 235		

# TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2112	
1969	1172	1002
1972	1000	3332
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1610	42583
Nutrients in Wet Manure: Nitrogen, Tons	23	294
Phosphorus, Tons	3	43
Potash, Tons	1.6	255

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Chickens	Turkey Hens	Turkeys Raised
165575		
104411		
114100		
82.9		
4729		
7	Combined	
74		
17		
	165575 104411 114100 82,9	Chickens Hens  165575 104411 114100  82.9 4729  Combined 74

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	(1) 520704	Number I-V farms	1578
Number of farms	2454	Acres in I-V farms	295871
Acres in farms	347836	Cropland I-V farms	253378
Cropland in farms	286584	Harvested cropland	
Harvested cropland in	arms 237662	I-V farms	216948

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	30923	4500	945	5445
GRAINS	33728	4522	54	4586
Wheat	21544	3103	58	3161
Oats	10758	1.271	6	1277
Barley	581	73	0	73
Rye	569	57	1	58
OTHER FIELD CROPS	134677	18520	772	19292
Soybeans	33211	2773	33	2806
Potatoes	637	285	1	285
Sugar beets				
Field beans	370	0	0	0
HAY OR GRASS SILAGE	14780	541	14	555
PASTURED CROPLAND	7115	71	0	71
Cropland used for pasture	6523	69	0	69
Improved pasture	592	2	0	2
VEGETABLES, SWEET CORN, MELONS	2810	473	28	501
ORCHARDS	207	22	0	22
BERRIES	139	20	0	20
NURSERY & GREENHOUSE PRODUCTS	100	55	1	23
OTHER CROPS	452	45	30	75
Total Fertilizer Used, Tons		28736	1854	30590
Percent of Fertilizer Used		94	6	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	41113	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	7831	1972	0	800	800
Total	48944	Tonnages for Other Recent Years			
Primary Nutrients in Fertilizer	23983	I AOI	mages for our	let we cente 144	-
Nitrogen	7914				
Phosphorus	7675				
Potash	8304				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile	
1970-71	4681	16.4	
1971-72	5813	19.4	
1972-73	6313	19.8	
Total Estima	ted Tons Applied on All Hi	ghways in 1972-73,	

#### TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	secticides	Fungicides	Total
Table 1	4734.2		3.9	212.5	5450.6
Manure: K	ind of	Tons	of Material	is in Wet Manure D	
Livesto	ck	Manure	Nitroge	n Phosphorus	Potash
Swine: Ta	ble 2	16629	83	23	63
Cattle: T		234792	1315	235	1174
Sheep: Ta	ble 4	1610	23	3	16
Horses: T		ble 4 42583 294		43	255
Chickens:	Table 5	4729	74	19	17
Turkeys:	Table 5	0			
Total from To	Livestock,	300343	1789	323	1525
Fertilizer	s:	Tons of		Fertilizers Applie	d
				imary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	48944	7914	7675	8394

Lime: Limestone equivalent purchased or applied, tons: Table 8 800

Salts: Applied on all highways, tons: Table 9 9157

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Huron 3.0 STATE: Michigan PLANNING SUBAREA: Central 3.2 COUNTY: Tuscola

or Crops         Acres Treated         Used 100 lbs         Acres Treated         Used 109 lbs         Used 109 lbs         Acres 100 lbs         Used 109 lbs         Acres 100 lbs         Used 109 lbs         Acres 100 lbs         Used 109 lbs         Acres 109 lbs         Used 109 lbs         Acres 109 lbs         Used 109 lbs         Used 109 lbs         Acres 109 lbs         Used 109 lbs         Used 109 lbs         Acres 109 lbs         Used 109 lbs         Used 109 lbs         Acres 109 lbs         Used 109 lbs <th></th> <th colspan="2">Herbicides</th> <th colspan="2">Insecticides</th> <th colspan="2">Fungicides</th>		Herbicides		Insecticides		Fungicides	
Grains 32970 164.8 10990 109.9	or	Used	d			Used 100 lbs	
Hay or Grass Silage 7749 77.5 6458 64.6 - Pastured Cropland 4702 47.0 4702 47.0 Other Rield Crops 109392 2821.5 7135 220.2 1417 2: Vegetables 1150 69.0 575 17.2 695 6: Orchards Berries Nursery, Greenhouse Other Crops	rn	1702.	.4	13760	-	-	
Pastured Cropland	ains	164.8	.9	10990	-	CHr.	
Other Rield Crops 109392 2821.5 7135 220.2 1417 2. Vegetables 1150 69.0 575 17.2 695 61 Orchards Berries Nursery, Greenhouse Other Crops	y or Grass Silage	77.5	5	6458	-	1 44.	
Vegetables         1150         69.0         575         17.2         695         69           Orchards         Berries         8         8         8         10	stured Cropland	47.0	0	4702			
Orchards Berries Nursery, Greenhouse Other Crops	her Field Crops	2 2821.	.2	7135	1417	212.6	
Orchards Berries Nursery, Greenhouse Other Crops	getables	69.0	2	575	695	64.7	
Nursery, Greenhouse Other Crops	chards						
Other Crops	rries						
	rsery, Greenhouse						
Totals 217883 4882.6 43620 665.3 2112 2:	her Crops						
10tals   217883   4882.6   43620   055.3   6112   2.	tel.		7		2112	227.2	
						277.3 5825.	

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
ear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	9944	635	688	1323
969	9207	6.63	594	1257
972	9500	900	700	1600

1714	3300	300	700		1000
Wet Manure	Factor: Tons	per litter far	rowed	7.23	
Wet Manure	Defecated: Tor	ns, 1972		11568	
Nutrients i	n Wet Manure:	Nitrogen, tons	3	58	
		Phosphorus, to	ons	16	
		Potash, tons		44	

-		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves		
1964	37170	16581	20589		
1969	28335	11831	16505		
1972 31,000		12900	18100		
Wet Manure   Per Anima	Factor: Tons	13.14	6.45		
Wet Manure 1 Tons, 197		169506	116745		
	Defecated: Tons, 1972		286251		
Nutrients in Wet Manure: Nitroge			1603		
		orus, tons	286		
	Potash,	tons	1431		

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1885	
1969	2420	910
1972	2000	3028
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	3220	38698
Nutrients in Wet Manure: Nitrogen, Tons	45	267
Phosphorus, Tons	7	39
Potash, Tons	32	232

# TABLE 5-MANURE FROM CHICKENS & THRKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	224595		
1969	342495		
1972	356700		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	- 14785		
Nutrients in Wet Manure: Nitrogen, tons	231	Combined	
Phosphorus, tons	59		
Potash, tons	52		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres(1)	521536	Number I-V farms 1474
Number of farms	2208	Acres in I-V farms 304875
Acres in farms	359139	Cropland I-V farms 262617
Cropland in farms	298844	Harvested cropland
Harvested cropland in farms	238663	I-V farms 223427

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	39656	5878	1507	7385
GRAINS	51211	7331	252	7583
Wheat	28068	4345	193	4538
Oats	15928	1998	22	2020
Barley	5855	846	36	882
Rye	1297	136	1	137
OTHER FIELD CROPS	109428	16338	813	17151
Soybeans	3067	279	0	279
Potatoes	1417	824	0	824
Sugar beets			- 100	
Field beans	330	1	0	1
HAY OR GRASS SILAGE	21230	469	9	478
PASTURED CROPLAND	11847	137	- 14	141
Cropland used for pasture	11424	136	4	140
Improved pasture	423	1	0	1
VEGETABLES, SWEET CORN, MELONS	1604	232	18	250
ORCHARDS	260	14	1	15
BERRIES	8	2	0	2
NURSERY & GREENHOUSE PRODUCTS	1	1	0	1
OTHER CROPS	281	21	2	23
Total Fertilizer Used, Tons		30424	2606	33030
Percent of Fertilizer Used		92	8	100

TABLE 7FERTILIZER	USED IN 1972	TABLE	APPLIED	MESTONE EQUIV	ALENI
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	44392	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	8456	1972	691	590	1281
Total	52848		nages for Oth	10.0 0	
Primary Nutrients in Fertilizer	25896	100	nages for Oth	er kecent rea	-
Nitrogen	8546				
Phosphorus	8287				
Potash	9063				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	2706	18.8
1971-72	3501	24.5
1972-73	3166	20.8
Total Estima As Compute	ted Tons Applied on All H	Ighways in 1972-73,

### TABLE 10 -- SUMMARY OF ACRECULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	ecticides	Fungicides	Total
Table 1	4882.6	66	5,3	277.3	5825.2
Manure: K	ind of	Tons	of Materials	in Wet Manure	Defecated
Livesto	ck	Manure	Nitrogen	Phosphorus	Potash
Swine: Tal	ole 2	11568	58	16	44
Cattle: To	able 3	286251	1603	286	1431
Sheep: Tal	ole 4	3220	45	7	32
Horses: Ta	able 4	38698	267	39	232
Chickens:	Table 5	14785	231	59	52
Turkeys:	Table 5	0			
Total from Tor	Livestock,	354522	2204	407	1791
Fertilizer	81	Tons of		tilizers Appli	ed
				ry Nutrients	
Ite		Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	52848	8546	8287	9063

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Salts: Applied on all highways, tons: Table 9 4592

## 6.3.2.3 Commercial Fertilizers

The 1972 figures show 265,332 metric tons (292,473 tons) of commercial fertilizers were applied to croplands in Planning Subarea 3.2. Fertilizer usage is about 25 percent above Basin average and usage will continue to increase as it is essential to the production of these high valued crops. Nitrogen, phosphorus and potash represent 33, 32, and 35 percent respectively of the primary nutrients in the fertilizer. Overall fertilization rates are expected to increase perhaps as much as 25 percent in the next 10 years.

# 6.3.2.4 Lime

Lime application is one of the lowest in this area and is projected to remain at this low level. For 1972, a total of 20,221 metric tons (22,290 tons) of limestone was either purchased or applied to croplands.

## 6.3.2.5 Salts

Road salt de-icing usage is relatively modest in this area. This represents a normal application rate for these counties. Thus, salt de-icing is not expected to increase greatly. The amount applied in 1972 was 65,236 metric tons (71,909 tons) for all highways in Planning Subarea 3.2.

# Section 7

### MATERIALS USAGE IN THE LAKE ERIE BASIN

#### 7.1 Basin Characteristics

This planning area encompasses agricultural land bordering Lake Huron on its west, Lake Erie along its entire length on the south, and then bordering western Lake Ontario with Niagara County on the south. Included are Michigan, Ohio, Pennsylvania, and New York counties.

# 7.1.1 Agricultural Characteristics

There are wide variations in the types of agriculture conducted in this lake basin. Those found here include dairy and swine areas, and large acreages of corn and soybeans. Areas near the lake produce fruit and grapes.

As one studies the figures and tries to observe the trends, there does not appear to be any compelling reasons for expecting major shifts or changes in types of agriculture. The dairy areas will likely continue to emphasize dairying but cow numbers will decrease. The corn belt can maximize returns by raising corn and soybeans which support swine production and cattle feeding. Corn will continue as "king". Soybean acreages may increase. Swine and cattle production may increase. The fruit, grape and vegetable regions will undergo shifts but these enterprises will continue to be emphasized here. Farm numbers will decline and individual units will get larger. For a long while it was thought that this led to more extensive types of farming operations. However, now there is much evidence that with larger units more specialization develops, with the result that production may be intensified. This is the most likely trend for the future.

Table 7-1 indicates the relative proportion of material usage in the Lake Erie basin as compared to the total U.S. Great Lakes Basin.

Table 7-1

MATERIALS USAGE BASIN RELATIONSHIP -- LAKE ERIE 4.0 TO GREAT LAKES

Per harvested acre of cropland	Lake Erie basin	Great Lakes Basin
Lbs of chemicals applied Index of chemicals applied	2.52 95	2,66 100
Tons of livestock manure defecated Index of manure defecated	2.51 74	3.37 100
Lbs primary nutrients in livestock manure Index primary nutrients in manure	63 77	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	340 23 106	321 22 100
Lbs primary nutrients in commercial fertili Index primary nutrients in commercial fertil		153 100
Lbs of lime applied Index of lime applied	180 106	170 100
Per acre of total land area Lbs road salts used Index road salts used	69.18 166	41.74 100
To Convert From Pounds (1b) Tons (ton)  To Kilograms (kilograms (kilograms (kilograms (kilograms)))	cg)	Multiply By 0.454 907.2 0.907

# 7.1.2 Materials Usage

An inventory and analysis of materials usage was based on personal interviews, correspondence, and statistics as available from agricultural statistics, census information, state highway departments, universities, private companies, and state and federal agencies. Background for the analysis is presented in Section 2 - Methodology. Table 7-2 summarizes the findings of this inventory and analysis. Detailed statistics are shown on Table 7-3.

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Table 7-2

MATERIALS USAGE
(in 1972)

Area Lake Erie basin PSA 4.1 PSA 4.2 PSA 4.3 PSA 4.4	Chemicals Applied to Crops (100 1bs) 142,445 23,598 79,543 7,026 32,278	Livestock Manure (tons) 14,186,552 3,595,528 6,312,949 1,688,055 2,590,020	Commercial Fertilizer on Cropland (tons) 962,952 197,618 651,276 42,726 71,332	Limestone Purchased or Applied (tons) 510,419 48,932 306,809 75,890 78,788	Salts Applied to all Highways (tons) 543,417 175,619 115,170 136,046 116,582
To Convert From Pounds (1b) Tons (ton)		To Kilograms Kilograms Metric To	(kg)	Multip1 0.454 907.2 0.907	TOTAL STATE

# 7.1.2.1 Agricultural Chemicals

There was a total of 6,461,200 kilograms (14,244,500 lbs) of agricultural chemicals spread on agricultural lands in the Lake Erie basin in 1972. Chemical rates are projected to increase in this area 15-25 percent in the next 10 years. Herbicide usage is most likely to increase nearer the top level of this range. Insecticide usage may increase even less than fungicide use and might possibly show no increase.

Herbicides range from as high as 83 percent of all chemicals used in one subarea to a low of only 20 percent in another. Insecticides range from 50 to 13 percent and fungicides from 30 to 4 percent. This makes it difficult to generalize about the area.

One of the problems concerning the use of chemicals, even if effective in performing their functional roles, is that some residues will still remain in the soils. In the case of herbicides, this is known as "carryover" and in the case of insecticides as "persistence." It is believed that the persistence associated with insecticides will be almost entirely eliminated in the future and that carryover in herbicides will be greatly reduced, if not entirely eliminated.

# 7.1.2.2 Animal Wastes

It was estimated that 12,869,800 metric tons (14,186,552 tons) of wet manure are produced annually. Nitrogen, phosphorus and potash comprise 1.3 percent of the total manure defecated. Percentages for the livestock vary greatly from one planning subarea to the next, however, cattle produce the majority of the manure. Cattle manure percentages range from as high as 85 to a low of 63 percent. Swine manure represents 19 percent of the livestock manure in one subarea and only one percent in another subarea. Horse manure is 20 percent of the total in one subarea and as low as 8 percent in another.

# 7.1.2.3 Commercial Fertilizers

A total of 873,575 metric tons (962,952 tons) of commercial fertilizers were applied to crops in the Lake Erie basin in 1972. Nitrogen accounted for 31 percent, phosphorus 32 percent, and potash 37 percent of the primary nutrient content by weight. Fertilizer rates are likely to increase — however, not all nutrients at the same rates. Overall it is expected that the nitrogen increase will be the greatest and the phosphorus use will increase the least.

#### 7.1.2.4 Lime

Liming rates seem to run considerably higher in some of the eastern basin counties. Lime usage is expected to continue at near present levels. It is projected that the greatest usage will continue to be in those counties and subareas where more than average amounts are already being used. In 1972 a total of 463,050 metric tons (510,419 tons) of lime were used in this lake basin.

# 7.1.2.5 Salts

The Lake Erie basin is second only to the Lake Michigan basin in the amount of road de-icing salts used on highways. In 1972-73 it was estimated that 492,988 metric tons (543,417 tons) of salts were used. This represented more than 30 percent of the salts used in the entire Great Lakes Basin.

The primary impact upon ground and surface waters resulting from road de-icing salts comes from chloride discharges which can, over time, affect the salinity of nearby wells and open water areas. Road de-icers will continue to be used in this area. Usage is expected to largely be determined by miles of highway as rates per mile are not expected to increase.

## 7.2 Planning Subarea 4.1

This subarea includes almost 60 percent of the population of Michigan. At the same time, these nine southeast Michigan counties, five bordering on the lake and four one county removed, are very important agricultural counties. The southern parts of Lenawee and Monroe Counties, bordering on the State of Ohio, are typical corn belt production areas.

# 7.2.1 Agricultural Characteristics

Agriculture is varied in this planning subarea. Sanilac County on the north is predominately dairy with cropping programs — corn, grain crops, and hay — supporting this industry. Sanilac also produced 17,000 hectares (42,000 acres) of navy beans as a cash crop. Lenawee County on the south is heavier in the production of corn, grain, and soybeans with much less hay. Cattle, dairy, and swine production are major livestock enterprises in the southeast Michigan counties. Monroe, Macomb, and St. Clair Counties produced 1,800, 1,600 and 1,200 hectares (4,400, 3,900 and 3,000 acres) of vegetables respectively.

Table 7-4 indicates the relative proportions of materials usage in Planning Subarea 4.1 in comparison with the total Great Lakes Basin.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds
Michigan, Indiana, Ohio,
PLANNING AREA: Lake Erie h.0 STATE: Permsylvania, and New York
Northwest 4.1 Central 4.3
PLANNING SUBAREA: Southwest h.2 East h.h COUNTY: 1-Pennsylvania, h-New York)

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972

cticides	Fungi	Lcides
Amount Used d 100 1bs	Acres	Amount Used
5930.6		
2062.0		
2164.7		
1477.1		
1889.5	7682	1152.9
4281.7	85186	10111.9
	-	Militarity R.
14851.1	52143	10409.
-	200042	
20/7// 7	31,7033	15974.1
	32656.7 0 1bs	

#### TABLE 2--MANURE FROM SWINE

Total
2000
83229
61617
81490
61

# TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	1184519	485920	698599
1969	982987	400795	582192
1972	1042378	491857	550521
Wet Manure I Per Animal	actor: Tons	13.14	6.45
Wet Manure I Tons, 1972		6463001	3550860
Wet Manure I Nutrients in		ogen, tons 5	0013861 6078 0014 0069

#### TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	368600	
1969	308986	ורון
1972	254135	141495 148638
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	409157	1899593
Nutrients in Wet Manure: Nitrogen, Tons	5728	13107
Phosphorus, Tons	5728 858	1900
Potash, Tons	4092	11398

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey	Turkeys
1964	8466439		
1969	8327303		
1972	88078111	234960	2298100
Wet Manure Factor: Lbs. per bird	82.9	365.0	89.63
Wet Manure Defecated: Tons, 1972	365085		
Nutrients in Wet Manure: Nitrogen, tons	5695	Combined	2253
Phosphorus, tons Potash, tons	11,60	-	578

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

Number of farms 653 Acres in farms 963	90 Ac 0551 Cr 0641 Ha	res in I-V opland I-V rvested cr		988
	Crop		of Fertilize	
Crops	Acres	Dry	Liquid	Total
CORN	1596413	253340	65173	318513
GRAINS	1005485	127347	5700	133047
Wheat	581215	81025	4343	85368
Oats	393669	43560	1310	14870
Barley	5494	619	10	629
Rye	11880	1021	20	10/1
OTHER FIELD CROPS	1670195	78036	7139	851.75
Soybeans	1546716	46815	3822	50637
Potatoes	14937	8849	415	9264
Sugar beets				
Field beans	38925	156	5	161
HAY OR GRASS SILAGE	745700	15657	511	16168
PASTURED CROPLAND	538192	5749	511	5895
Cropland used for pasture	463133	14747		4845
Improved pasture	75059	1002	98	1050
VEGETABLES, SWEET CORN, MELONS	103146	30185	3148	33333
ORCHARDS	61594	8601	868	9472
BERRIES	1658	374	20	394
NURSERY & GREENHOUSE PRODUCTS	11,258	4591	203	4794
OTHER CROPS	5539	297	22	329
Total Fertilizer Used, Tons		524336	82935	607271
Percent of Fertilizer Used	1	84	16	100

TABLE 7FERTILIZER	USED IN 1972	TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	gud 31	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid		1972			510119
Total	962952	and the same of th	anne for Orl	- D	
Primary Nutrients in Fertilizer	1477064	1011	nages for Oth	er Recent Yea	IS
Nitrogen	150090				
Phosphorus	154025				
Potash	172951				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	MI New Committee	
1971-72		
1972-73	374667	
Total Estima	ted Tons Applied on All Hi	ghways in 1972-73.

### TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY

Table 1	93814.7	The second secon	nsect 2656.	icides 7	Fungicides 15974.1	Total
Manure: Kind	of				in Wet Manure	
Livestock		Manu		Nitrogen		
Swine: Table		1353368		6874	1919	5138
Cattle: Tabl		10013861		56871	10155	50777 _
Sheep: Table		409157		5728	858 1893	4092
Horses: Tabl		1899593		13107	1893	11356
Chickens: Ta	ble 5	365085		5695	1460	1278
Turkeys: Tab		145488		2266	582	508
Total from Li Tons	vestock,	14186552		90541	16827	73149
Fertilizers:		Tons o	f Comm	mercial Fe	rtilizers Appl	ied
				Prim	ary Nutrients	
Item		Total	1	litrogen	Phosphorus	Potash
Applied on Cr Table 7	opland:	962952	15	0090	154025	172951
Lime: Limest Table	one equiva	lent purch	nased	or applied	d, tons:	

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Table 7-4

MATERIALS USAGE BASIN RELATIONSHIP -- PSA 4.1 TO GREAT LAKES

Per harvested acre of cropland	lanning Subarea 4.1	Great Lakes Basin
Lbs of chemicals applied Index of chemicals applied	2.21 83	2.66
Tons of livestock manure defecated Index of manure defecated	3.37 100	3.37
Lbs primary nutrients in livestock m		82
Index primary nutrients in manure	104	100
Lbs commercial fertilizer applied	370	321
Percent liquid fertilizer applied	16	32
Index commercial fertilizer applied	115	100
Lbs primary nutrients in commercial	fertilizer 181	153
Index primary nutrients in commercial	fertilizer 118	100
Lbs of lime applied	92	170
Index of lime applied	54	100
Per acre of total land area	20 Jan - April - Sale -	
Lbs of road salts used	87.96	41.74
Index road salts used	211	100
To Convert From	То	Multiply By
	ograms (kg)	0.454
	ograms (kg)	907.2
Meti	ric Tons	0.907

# 7.2.2 Materials Usage

Table 7-5 lists by county the material usage inventory for PSA 4.1. Detailed statistics are shown on Tables 7-6 to 7-15.

Table 7-5
MATERIALS USAGE
(in 1972)

PSA 4.1  Michigan  Lenawee Livingston Macomb Monroe Oakland St. Clair Sanilac Wastenaw Wayne TOTAL	Chemicals Applied to Crops (100 1bs) 5,206 1,241 1,621 4,306 604 2,161 5,206 2,680 573 23,598	Livestock Manure (tons) 564,214 385,983 204,158 207,015 275,359 420,734 881,456 542,482 114,127 3,595,528	Commercial Fertilizer on Cropland (tons) 50,637 10,506 10,885 35,563 4,267 15,901 47,078 18,643 4,138 197,618	Limestone Purchased or Applied (tons) 23,059 2,872 336 1,000 2,200 719 12,246 6,000 500 48,932	Salts Applied to all Highways (tons) 4,453 17,253 17,296 17,109 26,296 11,909 6,794 14,320 60,189 175,619
To Convert Fi Pounds (1b) Tons (ton)	com		and the same of th		1tiply By 0.454 07.2 0.907

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0

STATE: Michigan

PLANNING SUBAREA: Northwest 4,1

COUNTY: 9 county totals

Acres	Amount				Fungicides	
Treated	Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	
3/1/00	10221.8	52600	1239.0			
1308/8	654.4	43626	436.3			
69502	696.0	58001	560.0			
39326	393-3	39326	393.3			
232987	5016.1	17726	590.0	3930	590.0	
20446	644.1	13624	1274.9		868.7	
	-				11.15	
	1308/8 69602 39326 23298/	1308/8 654.4 69502 696.0 39326 393.3 23298/ 5016.1	1308/8 654.4 43626 69602 696.0 58001 39326 393.3 39326 23298/ 5016.1 17726	130878 554.4 43626 436.3 59502 596.0 58001 580.0 39326 393.3 39326 393.3 232987 5016.1 17726 590.0	130878 654.4 43626 436.3 69502 696.0 58001 580.0 39326 393.3 39326 393.3 23290 5016.1 17726 590.0 3930	

TABLE 2--MANURE FROM SWINE

Total Herbicides, Insecticides, Fungicides:

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	108955	9459	9052	18511
969	101632	5236	8337	16573
1972	104500	10700	9400	20100

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 145323
Nutrients in Wet Manure: Nitrogen, tons 726
Phosphorus, tons 203
Potash, tons 552

TABLE 3--MANURE FROM CATTLE

**		Course & Had Free	
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	331538	130295	201340
1969	260653	102351	158302
1972	285000	111400	173600
Wet Manure Fac Per Animal	tor: Tons	13.14	6.45
Wet Manure Def Tons, 1972	ecated:	1463793	1,119,720

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	106188	
1969	85602	12440
1972	70400	55975
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	113344	715.360
Nutrients in Wet Manure: Nitrogen, Tons	1585	4936
Phosphorus, Tons	237	716
Potash, Tons	1133	4292

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys
1964		1163139		
1969		890115		
1972		916500		
Wet Manure Facto	r: Lbs. per bird	82.9	-	
Wet Manure Defec	ated: Tons, 1972	37988		
Nutrients in Wet	Manure: Nitrogen, tons	593	Combined	
	Phosphorus, tons Potash, tons	153 133	Not signifi	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

 COUNTY, land area, acres 3992896 (1)
 Number I-V farms 8183

 Number of farms 14262
 Acres in I-V farms 1608771

 Acres in farms 2019455
 Cropland I-V farms 1338440

 Cropland in farms 1621120
 Harvested cropland

 Harvested cropland in farms 1068323
 I-V farms 951783

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	312204	47839	12208	60047
GRAINS	187612	24682	360	25042
Wheat	101122	14991	290	15281
Oats	79213	8933	62	8995
Barley	1342	141	2	143
Rye	2731	231	2	233
OTHER FIELD CROPS	222890	20833	1540	22373
Soybeans	160975	9486	581	10067
Potatoes	3944	2254	352	2606
Sugar beets				
Field beans	5585	24	0	24
HAY OR GRASS SILAGE	195854	4417	110	4527
PASTURED CROPLAND	124341	1108	8	1116
Cropland used for pasture	115229	945	8	953
Improved pasture	9112	163	0	163
VEGETABLES, SWEET CORN, MELONS	24065	6382	620	7002
ORCHARDS	6180	723	12	735
BERRIES	261	148	3	51
NURSERY & GREENHOUSE PRODUCTS	4812	2461	36	2497
OTHER CROPS	1690	91	6	97
Total Fertilizer Used, Tons		108608	14903	123511
Percent of Fertilizer Used		88	12	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

Item	Tons	_
Fertilizer Used on Crops: Solid	165999	Ye
Liquid	31619	100
Total	197618	19
Primary Nutrients in Fertilizer	96833	
Nitrogen	31956	71_
Phosphorus	30987	
Potash	33892	

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
1972	20428	28504	48932
Ton	nages for Oth	er Recent Yea	rs
			1

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	136205	33.7
1971-72	111219	29.6
1972-73	121082	31.2
Total Estin	sated Tons Applied on All Hi	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides 17625.7		secticides 3.5	Fungicides	Total 23597.9
Manure: Kind Livestock	of	Ton		s in Wet Manure	Defecated
Swine: Table	2 14	5323	726	203	552
Cattle: Table		03513	14468	2584	12918
Sheep: Table		3344	1585	237	1133
Horses: Table	4 71	5360	4936	716	4292
Chickens: Tab	le 5 37	988	593	153	133
Turkeys: Tabl	e 5 0		0	0	0
Total from Liv Tons		95528	22308	3893	19028
Fertilizers:		Tons of		ertilizers Appl:	ied
War and				mary Nutrients	1
Applied on Cro		fotal	Nitrogen	Phosphorus	Potash
Table 7		7618	31956	30986	33891

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 175619

Total Tonnage 23059

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Nichigan PLANNING SUBAREA: Hortiwest 4.1 COUNTY: Lenawee

	Herbi	lcides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres	Amount Used
Corn	98910	2720.0	21980	329.7		
Grains	26940	134.7	8980	89.8		
Hay or Grass Silage	6530	65.3	5442	54.4		
Pastured Cropland	3073	30.7	3073	30.7		
Other Field Crops	74739	1510.2	4917	78.0	274	41.1
Vegetables	951	27.4	477	34.0	872	60.8
Orchards					-	2010
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	211143	4488.3	44869	616.6	1146	101.9
Total Herbicides, In	secticide	s, Fungic	ides: 10	0 1bs	257158	5206.8

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	38578	3319	3141	6460
1969	38036	3141	3103	6244
1972	39100	4100	3500	7600

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 54948
Nutrients in Wet Manure: Nitrogen, tons 275 Phosphorus, tons
Potash, tons 209

The Part of Section 1 and the		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	54921	13314	41607		
1969	46691	10822	35869		
1972	51100	11800	39300		
Wet Manure Per Anima	Factor: Tons	13.14	6.45		
Wet Manure Tons, 197		155052	253485		
Wet Manure Nutrients i		2 Combined: 408537 gen, tons 2288 norus, tons 409 n, tons 2043	7.		

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	15648	1
1969	12765	1523
1972	10400	5634
Wet Manure Factor: Tons per animal	1.61	12.78
wet Manure Defecated: Tons, 1972	16744	72003
Nutrients in Wet Manure: Nitrogen, Tons	234	497
Phosphorus, Tons		72
Potash, Tons	167	432

TABLE 5--MANURE FROM CHICKENS & THREEYS

Year	Item	Chickens	Turkey	Turkeys Raised
1964		ox Oline		
1969		218435	_	
1972		284342		
Des Santa		289100		
Wet Manure Fact	or: Lbs. per bird	82.9		
		11983		
Nutrients in We	t Manure:	-	Combined	
	Nitrogen, tons	187	Committee	
	Phosphorus, tons	48		
	Potash, tons	42	-	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FA

COUNTY, land area, acres 481856 (1)	Number I-V farms 1637
Number of farms 2558	Acres in I-V farms 349366
Acres in farms 403602	Cropland I-V farms 297183
Cropland in farms 335283	Harvested cropland
Harvested cropland in farms 241044	I-V farms 222247

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	86049	14388	14642	19030
GRAINS	41849	6233	168	6401
Wheat	27809	4601	150	4751
Oats	13244	1571	17	1588
Barley	123	19		19
Rye	418	23	0	23
OTHER FIELD CROPS	73513	4443	523	4966
Soybeans	709/3	3579	415	3994
Potatoes	2/4	181	0	181
Sugar beets				-
Field beans	696	1	0	1
HAY OR GRASS SILAGE	19123	610	3	613
PASTURED CROPLAND	10900	105	0	105
Cropland used for pasture	9580	75	0	75
Improved pasture	1320	30	0	30
VEGETABLES, SWEET CORN, MELONS	1313	384	42	426
ORCHARDS	582	66	2	80
BERRIES	3	0	0	0
NURSERY & GREENHOUSE PRODUCTS	22	9	0	9
OTHER CROPS	773	28	1	29
Total Fertilizer Used, Tons		26267	5361	31648
Percent of Fertilizer Used		83	17	100

VALENT

TABLE /FERTILIZER	JSED IN 1972	APPLIED APPLIED			
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	42535	Year	Government Cost/Shared	Government Cost/Shared	
Liquid	8102	1972	8111	14948	
Total	50637		And in contrast and in contras	And the second second	
Primary Nutrients in Fertilizer	24812	100	nages for Oth	er mecent ie.	
Nitrogen	8188			-	
Phosphorus	7940				
Potach	8684				

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	22/1	11.3
1971-72	1865	9.3
1972-73	3070	14.3
Total Estin	mated Tons Applied on All Hi	ghways in 1972-73,

TABLE 10 -- SIMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbicio			Fungicides	Total
Table 1 4488.3	61	0.6	101.9	5206.8
Manure: Kind of	Ton	s of Materials	in Wet Manure	Defecated
Livestock		e Nitroger	Phosphorus	Potash
Swine: Table 2	54948		77	209
Cattle: Table 3	408537	2288	409	2043
Sheep: Table 4	16744	234	35	167
Horses: Table 4	72003	497	72	432
Chickens: Table 5	11983	187	48	42
Turkeys: Table 5	0	0	0	0
Total from Livestock, Tons	564215	3481	641	2893
Fertilizers:	Tons of		rtilizers Appli	ed
			ary Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	50637	8188	7940	0684

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 4453

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Michigan

PLANNING SUBAREA: Northwest 4.1

COUNTY: Livingston TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated		Acres Treated	Amount Used 100 1bs
Corn	29250	804.4	6500	97.5		
Grains	5430	27.2	1810	18.1		
Hay or Grass Silage	8754	87.5	7295	73.0		
Pastured Cropland	4124	41.2	4124	41.2		
Other Field Crops	676	14.2	61	2.8	23	3.4
Vegetables	540	4.8	192	25.9	240	.2
Orchards						
Berries	100			-		
Nursery, Greenhouse						
Other Crops						
Totals	48474	979.3	19982	258.5	263	3.6

Totals	48474	979.3	19982	258.5	263	3.6
Total Herbicides,	Insecticid	es, Fungi	cides: 1	100 lbs	68719	1241.4

TABLE	2-MANU	JRE I	ROM	SWIN	E

	Hog & Pig	Number Sows Farrowing			
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	5535	645	573	1218	
1969	5812	445	530	975	
1972	6000	600	600	1200	

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 8676
Nutrients in Wet Manure: Nitrogen, tons 43
Phosphorus, tons 12
Potash, tons 33

TABLE 3-MANURE FROM CATTLE

fers Heifers, Steers, d Bulls, Calves
27001
15204
16600
6.45
107070

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	12240	
1969	7497	1426
1972	6100	6362
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	9821	81306
Nutrients in Wet Manure: Nitrogen, Tons	137	561
Phosphorus, Tone	21	81
Potash, Tons	98	488

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		70816		
1969		10550		
1972		9800		
Wet Manure Factor: Lb	s. per bird	82.9		
Wet Manure Defecated:	Tons, 1972	406		
Nutrients in Wet Manua	e: gen, tons	6	Combined	
	horus, tons	2	-	
Potas	h, tons	1		

COUNTY, land area, acres 366080 Number of farms 1099 Acres in farms 174047 Cropland in farms 119832 Harvested cropland in farms 7181	Cro Har	es in I-V pland I-V vested cr	arms 536 farms 1285 farms 9287 opland farms 6276	4
	Crop	Tons	of Fertilize	
Crops	Acres	Dry	Liquid	Total
CORN	25761	3352	516	3868
GRAINS	10169	1065	31	1096
Wheat	5208	583	28	611
Oats	4333	431	1	432
Barley	48	5	0	5
Rye	412	23	0	23
OTHER FIELD CROPS	828	85	18	103
Soybeans	676	47	18	65
Potatoes	23	22	0	22
Sugar beets	The second second			
Field beans	836	3 543	0	3
HAY OR GRASS SILAGE	24097	543	9	552
PASTURED CROPLAND	12362	143	0	143
Cropland used for pasture	11069	124	0	124
Improved pasture	1293	19	0	19
VEGETABLES, SWEET CORN, MELONS	443	112	2	114
ORCHARDS	671	3	14	34
REPRIEC	131	0	0	0

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

NURSERY & GREENHOUSE PRODUCTS OTHER CROPS Total Fertilizer Used, Tons

Percent of Fertilizer Used

LIDDE C TOTAL LIBERTY		7.	APPLIED		O TOTAL VALUE
Item	Tons	-	Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	8825	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1681	1972	2351	521	2872
Total	10506			ner Recent Yea	
Primary Nutrients in		101	mages for our	ier Recent 1ea	LAGI
Fertilizer	5148				-
Nitrogen	1699				
Phosphorus	1647				
Potash	1802				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	12335	28.9
1971-72	12417	28.7
1972-73	11895	25.5
Total Esti	mated Tons Applied on All uted 17253	Highways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide 979.3	s Insec	ticides	Fungicides	Total 1241.4
Manure: K	ind of	Tons o	f Materials	in Wet Manure D	efecated
Livesto	ck	Manure	Nitrogen	Phosphorus	Potasi
Swine: Tab	le 2	8676	43	12	33
Cattle: Ta	able 3	285774	1600	286	1429
Sheep: Tal	ole 4	9821	137	21	98
Horses: Ta		81306	561	81	488
Chickens:		406	6	2	1
Turkeys:	Cable 5	0	0	0	0
	Livestock,	385983	2347	402	2049

Fertilizers:	Tons of	THE RESERVE OF THE PARTY OF THE	tilizers Applied ry Nutrients	1
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	10506	1699	1647	1802

Limestone equivalent purchased or applied, tons: Table 8

Salts: Applied on all highways, tons: Table 9 17253

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Eric 4.0 STATE: Richigan
PLANNING SUBAREA: Northwest 4.1 COUNTY: Macomin

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS,	1972
The same of the same of		The same of the sa	-	-		-		-

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	18900	519.8	4200	63.0		
Grains	6120	30.6	2040	20.4		
Hay or Grass Silage	3694	36.9	3078	30.8		
Pastured Cropland	1725	17.2	1725	17.2		
Other Field Crops	6952	150.4	864	57.7	469	70.4
Vegetables	3815	112.6	2949	343.9	3197	150.5
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	41206	867.5	14856	533.0	3666	220.9
Total Herbicides, In					59728	1621.4

#### TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	4072	326	358	684
1969	2649	227	163	390
1972	2700	300	200	500

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 3615
Nutrients in Wet Manure: Nitrogen, tons 18
Phosphorus, tons 5
Potash, tons 14

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle	Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	19872	10378	9494				
1969	12574	6400	6174				
1972	13800	7000	6800				
Wet Manure Per Anim	Factor: Tons	13.14	6.45				
Wet Manure Tons, 19	Defecated:	91890	43860				
	in Wet Manure: Nitr	72 Combined: 135840 ogen, tons 761 ophorus, tons 136 ophorus, tons 679					

## TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep &	Horses & Ponies
1964	2733	
1969	1683	737
1972	1400	4664
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2254	59606
Nutrients in Wet Manure: Nitrogen, Tons	32	411
Phosphorus, Tons	5	60
Potash, Tons	23	358

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	1	Chickens	Turkey Hens	Turkeys Raised
1964		102215		
1969		62489		
1972		68600		
Wet Manure Factor: Lbs. pe	r bird	82.9		
wet Manure Defecated: Tons	, 1972	2843		
Nutrients in Wet Manure: Nitrogen,		44	Combined	
Phosphorus	, tons	11		
Potash, to		10		

#### TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 307328 (1)	Number I-V farms 577
Number of farms 997	Acres in I-V farms /24/6
Acres in farms 96934	Cropland I-V farms 00208
Cropland in farms 77368 Rarvested cropland in farms 47339	Harvested cropland I-V farms 41074

	Crop	Tons	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total		
CORN	13022	1967	370	2337		
GRAINS	7230	985	11	996		
Wheat	3398	507	6	513		
Oats	3076	388	5	393		
Barley						
Rye	252	23	0	23		
OTHER FIELD CROPS	4006	593	9	602		
Soybeans	2544	266	3	269		
Potatoes	469	193	0	193		
Sugar beets						
Field beans	139	0	0	0		
HAY OR GRASS SILAGE	10024	226	0	226		
PASTURED CROPLAND	4780	74	1	75		
Cropland used for pasture	4299	41	1	42		
Improved pasture	487	33	0	33		
VEGETABLES, SWEET CORN, MELONS	5270	1796	48	1844		
ORCHARDS	1401	271	0	271		
BERRIES	50	7	0	7		
NURSERY & GREENHOUSE PRODUCTS	762	441	2	443		
OTHER CROPS	13	2	. 0	2		
Total Fertilizer Used, Tons		6362	441	6803		
Percent of Fertilizer Used		94	6	100		

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

		APPLIED					
Item	9143 Year		Tonnage	Tonnage not			
OH OTOBOL SELECT		Government Cost/Shared	Government Cost/Shared	Total Tonnage			
Liquid	1/42	1972	301	35	336		
Total	10885			er Recent Yes			
Primary Nutrients in Fertilizer	5334	100	nages for our	L RECEIL SEG	-		
Nitrogen	1760						
Phosphorus	1707						
Potach	1867						

#### TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

1970-71 13064 39.8	
1971-72 10736 32.9	
1972-73 11925 36.9 Total Estimated Tons Applied on All Highways in 1972-73,	

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1 B67.5	Insec 533.0	ticides	Fungicides 220.9	Total 1621.4
Manure: Kind of		f Materials		
Livestock	Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2	3015	18	5	14
Cattle: Table 3	135840	761	136	679
Sheep: Table 4	2254	32	5.	23
Horses: Table 4	59606	411	60	358
Chickens: Table 5	2843	1414	11	10
Turkeys: Table 5	0			
Total from Livestock, Tons	204158	1286	94	1084

Fertilizers: Tons of		Primary Nutrients				
Item	Total	Nitrogen	Phosphorus	Potash		
Applied on Cropland: Table 7	10885	17:50	1707	1867		

Lime: Limestone equivalent purchased or applied, tons:

Table 8 336

Salts: Applied on all highways, tons: Table 9 1/296

To Convert From

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: Nichigan PLANNING AREA: Lake Erie 4.0 COUNTY: Monroe

PLANNING SUBAREA: Northwest 4.1

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	41400	1138.5	9200	138.0	and the same	
Grains	17550	87.8	5850	58.5		
Hay or Grass Silage	1892	18.9	1577	15.8		
Pastured Cropland	1000	10.0	1000	10.0		
Other Field Crops	72207	1475.1	7021	350.1	2665	399.8
Vegetables	4226	124.0	2456	238.0	3765	242.2
Orchards			THE RESERVE			
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	138275	2854.3	27104	810.4	6430	642.0

	Hog & Pig	Number So	ws Farrowing	
lear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	16887	1378	1410	2788
969	15408	1111	1117	2228
1972	15900	1400	1300	2700

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972 19521
Nutrients in Wet Manure: Nitrogen, tons 98 Phosphorus, tons 27 Potash, tons 74

THE R WANTED TOOM CATTER P

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	16852	4195	12657			
1969	13984	2928	11056			
1972	15300	3200	12100			
Wet Manure Per Anii	Factor: Tons	13.14	6.45			
Wet Manure Tons, 1	Pofecated:	42048	78045			
Wet Manur	e Defecated: Tons, 197 in Wet Manure: Nitro Phosp	22 Combined: 120093 ggen, tons 673 shorus, tons 120				

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	4368	
1969	4441	942
1972	3600	4440
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	5796	56743
Nutrients in Wet Manure: Nitrogen, Tons	81	392
Phosphorus, Tons	12 58	57
Potash, Tons	58	340

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	200095		
1969	106870		
1972	117300		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	4862		
Nutrients in Wet Manure: Nitrogen, tons	76	Combined	
Phosphorus, tons Potash, tons	19		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 356544 (1) Number I-V farms 1140 Number 1-V farms 100487 Acres in I-V farms 210487 Cropland I-V farms 189031 Harvested cropland I-V farms 144397 Number of farms 2000
Acres in farms 253927
Cropland in farms 221396
Harvested cropland in farms 162585

	Crop	Tons o	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	Total	
CORN	39791	6719	1896	8615	
GRAINS	27659	4164	22	4186	
Wheat	19424	3209	22	3231	
Oats	7673	902	0	902	
Barley	57	9	0	9	
Rye	468	44	0	44	
OTHER FIELD CROPS	66584	6560	528	7088	
Sovbeans	60471	3649	-68	3717	
Potatoes	2665	1773	280	2053	
Sugar beets					
Field beans	89	0	0	0	
HAY OR GRASS SILAGE	5358	152	2	154	
PASTURED CROPLAND	3185	32	0	32	
Cropland used for pasture	2790	28	0	28	
Improved pasture	395	4	0	4	
VEGETABLES, SWEET CORN, MELONS	4840	1664	241	1905	
ORCHARDS	392	65	0	65	
BERRIES	62	14	3	17	
NURSERY & GREENHOUSE PRODUCTS	672	123	29	152	
OTHER CROPS	437	1.3	0	13	
Total Fertilizer Used, Tons		19506	2721	22227	
Percent of Fertilizer Used		88	12	100	

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

		APPLIED					
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	28973	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	5690	1972	0	1000	1000		
Total	35563	Ton	nages for Orb	er Recent Yea	rs		
Primary Nutrients in Fertilizer	17426	100	mages 101 cer		-		
Nitrogen	5751						
Phosphorus	5576						
Potash	6099						

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	8231	31.5
1971-72	7767	29.9
1972-73	11796	40.3
	imated Tons Applied on All Imputed 17109	lighways in 1972-73,

	Herbicide	s In	secticides	Fungicides 642.0	Total 4306.7
Table 1	2854.3			17.000	1
Manure: Kind of		Ton	s of Material	s in Wet Manure	
Livestoc	k	Manur			
Swine: Tab	1e 2	19521	98	27	74
Cattle: Ta	ble 3	120093	673	120	600
Sheep: Table 4		5796	81	12	58
Horses: Table 4		56743	392	57	340
Chickens: Table 5		4862	76	19	17
Turkeys: Table 5		0			
Total from Livestock, Tons		207015	1320	235	1036
Fertilizers	1	Tons of	Commercial	Fertilizers Appl	ied
			Pri	Lmary Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potasi
Applied on Cropland: Table 7		35563	5751	5576	6099

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 17109

Agricultural Chemicals, Manures, Pertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0	STATE: Michigan
PLANNING SUBAREA: Northwest 4,1	COUNTY: Oalcland

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972	

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs		Amount Used 100 1bs
Corn	11250	309.4	2500	37.5		
Grains	2976	14.9	992	9.9		
Hay or Grass Silage	4361	43.6	3634	36.3		
Pastured Cropland	3546	35.5	3546	35.5		
Other Field Crops	322	7.3	106	10.7	91	13.0
Vegetables	384	7.7	307	41.5	91 384	- 4
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	22839		11085	171.4	475	14.0
Total Herbicides, In	secticide	s, Fungic	ides: 10	0 lbs	34399	603.8

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	2970	258	300	558
1969	3009	214	170	384
1972	3100	300	200	500

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 3615
Nutrients in Wet Manure: Nitrogen, tons 18
Phosphorus, tons 5
Potash, tons 14

TABLE 3-MANURE FROM CATTLE

		Number Catt	le and Calves
Year Total		Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	18218	6839	11319
1969	12008	4326	7682
1972	13100	4700	8400
Wet Manure Per Anim		13.14	6.45
Wet Manure Tons, 19	Defecated:	61758	54180
Wet Manure Nutrients		1972 Combined: 1159 trogen, tons 649 tosphorus, tons 116 tash, tons 580	38.

TABLE 4-MANURE FROM SHEEP AND HORSES

Year	Item	Sheep & Lambs	Horses & Ponies
1964		4438	
1969		2584	2442
1972		2100	11717
Wet Manure Facto	r: Tons per animal	1.61	12.78
wet Manure Defec	ated: Tons, 1972	3381	149743
Nutrients in Wet	Manure: Nitrogen, Tons	47	1.033
	Phosphorus, Tons	7	150
	Potach Tong	34	B98

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	87271		
1969	55162		
1972	64700		
Wet Manure Factor: Lbs. per bird	82.9		
Tong 1072	2662		
Nitrogen, tons	42	Combined	
Phosphorus, tons	11		
Potash, tons	9	1	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 554550 (1)	Number I-V farms 378
Number of farms 863	Acres in I-V farms 72547
Acres in farms 101820	Cropland I-V farms 51135
Cropland in farms 68065	Harvested cropland
Harvested cropland in farms 33302	I-V farms 2/977
married and anopassis all action 333	2.7 20200 61377

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	8936	1207	145	1352
GRAINS	5553	563	8	571
Wheat	3063	315	3	318
Oats	2191	219	3	222
Barley	18	2	0	2
Rye	118	8	2	10
OTHER FIELD CROPS	465	76	1	77
Soybeans	323	29	1	30
Potatoes	323 91	44	0	194
Sugar beets				
Field beans	181	0.	0	0
HAY OR GRASS SILAGE	11039	125	0	125
PASTURED CROPLAND	11189	82	3	85
Cropland used for pasture	9853	72	3	75
Improved pasture	1336	10	0	10
VEGETABLES, SWEET CORN, MELONS	552	75	53	128
ORCHARDS	1023	78	0	78
BERRIES	19	8	0	78 B
NURSERY & GREENHOUSE PRODUCTS	360	240	3	243
OTHER CROPS	1000		84 8	
Total Fertilizer Used, Tons		2454	213	2667
Percent of Fertilizer Used		92	8	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED					
Item	Tons		Tonnage	Tonnage not				
Fertilizer Used on Crops: Solid	3584	Year	Government Cost/Shared	Government	Total Tonnage			
Liquid	683	1972	1487	713	2200			
Total	4267			er Recent Yea				
Primary Nutrients in Fertilizer	2091	1011	mages for oth	er wedent rea	1.5			
Nitrogen	690							
Phosphorus	669							
Potash	732							

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	21531	39.4
1971-72	21198	38.7
1972-73	18130	31.0
Total Est As Com	Imated Tons Applied on Al	1 Highways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides 418.4	Insec 171.4	cticides	Fungicides	Total 603.8
Manure: K	ind of	Tons o	Materials Nitrogen	in Wet Manure I	
Swine: Tal	ole 2	3615	16	5	2.4
Cattle: Ta	able 3	115938	649	116	580
Sheep: Tal	ole 4	3381	47	7	34
Horses: Ta		149743	1033	150	898
Chickens:	Table 5	26/2	142	Ш	9
Turkeys:	Table 5	0			
Total from Tot	Livestock,	275359	1789	289	1013
Fertilizers	3:	Tons of Co		rtilizers Applie	ed
Ite		Total	Nitrogen	Phosphorus	Potasi

Applied on Cropland:
Table 7 4267 690 669 732

Lime: Limestone equivalent purchased or applied, tons:
Table 8 2200

Salts: Applied on all highways, tons: Table 9 26296

(1) County, land area, acres

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Michigan PLANNING SUBAREA: Northwest 4.1 COUNTY: St. Clair

	Herbi	Lcides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	34200	940.5	7600	114.0		
Grains	12786	63.9	4262	42.6		
Hay or Grass Silage	10162	101.6	8468	84.7		
Pastured Cropland	6696	67.0	6696	67.0		
Other Field Crops	12691	259 0	802	15.3	70	10.5
Vegetables	2939	86.9	2285	149.8	2331	128.1
Orchards						20072
Berries						
Nursery, Greenhouse						-
Other Crops						
Totals	79474	1548.9	30113	473.4	2401	138.5

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	5005	462	421	883
1969	3547	280	373	653
1972	3600	400	400	800

Wet Manure Factor: Tons per litter farrowed 7.23 Wet Manure Defecated: Tons, 1972 5784 Nutrients in Wet Manure: Nitrogen, tons 29 Phosphorus, tons Potash, tons

		Number Catt	Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves				
1964	45114	18718	26396				
1969	34506	13100	21406				
1972	37700	14200	23500				
t Manure F Per Animal	ictor: Tons	13.14	6.45				
t Manure D	efecated:	186588	151575				
Tons, 1972 t Manure D	fecated: Tons, 1 Wet Manure: Nit Pho	972 Combined: 338163					

TABLE 4--MANURE FROM SHEEP AND I

Year Item	Sheep & Lambs	Horses & Ponies
1964	3564	
1969	2350	1325
1972	1900	5231
Wet Manure Factor: Tons per animal	1.61	12.76
Wet Manure Defecated: Tons, 1972	3059	66852
Nutrients in Wet Manure: Nitrogen, Tons	43	461
Phosphorus, Tons	6	67
Potash, Tons	31	401

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys
1964	207395		
1969	167282		
1972	165900		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	6877		
Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons	107 28 24	Combined	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 469568 (1)	Number I-V farms 813
Number of farms 1002	Acres in I-V farms 150176
Acres in farms 218207	Cropland I-V farms 124351
Cropland in farms 174358	Harvested cropland
Harvested cropland in farms 97441	I-V farms 79966

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	25500	4052	828	4886
GRAINS	19171	1933	23	1956
Wheat	7578	1069	15	1084
Oats	5662	657	8	665
Barley	261	16	0	16
Rye	241	50	0	20
OTHER FIELD CROPS	10704	1530	142	1572
Soybeans	3651	430	4	14314
Potatoes	70	27	0	27
Sugar beets				
Field beans	289	12	0	12
HAY OR GRASS SILAGE	25147	392	8	400
PASTURED CROPLAND	18507	99	0	99
Cropland used for pasture	17870		0	91
Improved pasture	637	91 8	0	91 8
VEGETABLES, SWEET CORN, MELONS	3012	796	122	918
ORCHARDS	394	29	1	30
BERRIES	3	0	0	0
NURSERY & GREENHOUSE PRODUCTS	188	69	0	69
OTHER CROPS	13	2	0	2
Total Fertilizer Used, Tons		8914	1024	9938
Percent of Fertilizer Used		90	10	100

TABLE 7FERTILIZER	USED IN 1972	TABLE	8-GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	191	
Fertilizer Used on Crops: Solid	13357	Year	Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
Total	2544	1972	304	415	719
Primary Nutrients in Fertilizer	15901	Tor	inages for Oth	er Recent Yea	
Nitrogen	2571				
Phosphorus	2493				
Potash	2727				

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	8752	36.4
1971-72	8772	36.4 36.8
1972-73	8211	32.3
Total Est As Com	imated Tons Applied on All H puted 11909	ighways in 1972-73,

	** * * * *				
Table 1	Herbicide 1548.9	473	nsecticides	Fungicides 138.5	2160.8
Manure: Kin	d of	To	ns of Material	Is in Wet Manure	Defecated
Livestock		Manu			
Swine: Table	2 2	5784	29	8	22
Cattle: Tab.	le 3	338163	1.894	338	1691
Sheep: Table	2 4	3059		6	
Horses: Tab	le 4	66852	43	67	31 401
Chickens: Ta	able 5	6877	107	28	24
Turkeys: Tal	ole 5	0			
Total from L: Tons	lvestock,	420735	2534	447	2169
Fertilizers:		Tons o	f Commercial I	Pertilizers Appli	ed
				mary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potasi
Applied on Ci		15001	2571	olios	0.000

		Primary Nutrients			
Item	Total	Nitrogen Phosphor		Potas	
Applied on Cropland: Table 7	15901	2571	2493	2727	

Table 8 719

Salts: Applied on all highways, tons: Table 9 11909

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0

STATE: Michigan

COUNTY: Sanilac

PLANNING SUBAREA: Northwest 4.1

TARLE	IESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972	

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	79740	2192.8	17720	265.8		
Grains	40290	201.4	13430	134.3		
Hay or Grass Silage	22574	225.7	18812	188.1	1 - V	
Pastured Cropland	12548	125.5	12548	125.5		
Other Field Crops	48416	1227.4	2574	25.7		
Vegetables	4104	190.1	2130	87.3	2912	217.1
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	207672	4162.9	67214	826.7	2912	217.1
Total Herbicides, In					277798	5206.7

#### TARTE 2 -- MANTIDE PROM SUTNE

	Hog & Pig	Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	7181	660	641	1301
1969	7697	773	794	1567
1972	7900	900	900	1800

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 13014
Nutrients in Wet Manure: Nitrogen, tons 55
Phosphorus, tons 18 Potash, tons

### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year Total		Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	94859	42523	52336			
1969	77314	37153	40161			
1972	84500	40400	44100			
Wet Manure Per Anima	Factor: Tons	13.14	6.45			
Wet Manure Tons, 19	Defecated: 72	530856	284445			
	Defecated: Tons, 1972 in Wet Manure: Nitroge Phosphe Potash	en, tons 4566 orus, tons 815				

## TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2983	
1969	1421	1415
1972	1200	3875
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1932	49523
Nutrients in Wet Manure: Nitrogen, Tons	27	342
Phosphorus, Tons		50
Potash, Tons	19	297

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		91901		
1969		41358		
1972		40700		
Wet Manure Facto	or: Lbs. per bird	82.9		
Met Manure Defe	cated: Tone 1972	1687		
Nutrients in Wet Manure:	Manure: Nitrogen, tons	26	Combined	
	Phosphorus, tons	7		
	Potash, tons	6	Sec	

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 615040 (1)	Number I-V farms 1850
Number of farms 2787	Acres in I-V farms 381942
Acres in farms 461108	Cropland I-V farms 329838
Cropland in farms 389101	Harvested cropland
Harvested cropland in farms 203195	I-V farms 239245

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	86875	10243	2485	12728
GRAINS	50995	0424	57	0481
Wheat	19/50	5/85	32	2614
Oats	29720	3471	25	3496
Barley	600	72	0	72
Rye	615		0	
OTHER FIELD CROPS	47299	1040	277	5678
Soybeans	3196	354	0	354
Potatoes	9	2	2	4
Sugar beets				
Field beans	1702	14	0	14
HAY OR GRASS SILAGE	67845	1735	81	1816
PASTURED CROPLAND	41704	374	2	376
Cropland used for pasture	40389	348	2	350
Improved pasture	1395	25	0	26
VEGETABLES, SWEET CORN, MELONS	4691	640	13	653
ORCHARDS	731	71	0	71
BERRIES	45	3	0	3
NURSERY & GREENHOUSE PRODUCTS	965	574	0	574
OTHER CROPS	279	35	5	40
Total Fertilizer Used, Tons		26504	2920	29424
Percent of Fertilizer Used	The second second	90	10	100

## TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

A SAME TO SAME THE SA			APPLIED		-	
Item	Tons		Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	39545	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	7533	1972	4246	8000	12246	
Total	47078	Tonnages for Other Recent Years				
Primary Nutrients in Fertilizer	23068	400	mages for our	er mecene rea		
Nitrogen	7613	-				
Phosphorus	7362					
Potash	8073					

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	3588	21.2
1971-72	3930	23.4
1972-73	4684	26.1
Total Est	imated Tons Applied on All	Highways in 1972-73,

#### Y OF ACRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	In 826	secticides	Fungicides	Total 5200 7
Table 1	410013	-			
Manure: Kind	of	Ton	s of Materia	ls in Wet Manure	
Livestock		Manur	e Nitrog	en Phosphorus	
Swine: Table		13014	85	10	49
Cattle: Tabl		815301	4566	815	4077
Sheep: Table		1932 27		4	19
Horses: Tabl		49523	342	50	297
Chickens: Ta		1657	26	7	6
Turkeys: Tab		0			
Total from Li Tons		881457	5026	594	4448
Fertilizers:		Tons of		Fertilizers Appl:	ied
			Pr	imary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on Cr Table 7	ropland:	7078	7613	7392	8073

Salts: Applied on all highways, tons: Table 9 6794

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Michigan

PLANNING SUBAREA: Nort west 4.1

14.1 COUNTY: Was tenaw

TARLE	1-ESTIMATED	AMOTINTES	CVF	CHEMICALS	HERD	CY32	CROPC	1072

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	54540	1499.8	12120	181.8		
Grains	17316	86.6	5172	27.7		
Hay or Grass Silage	10841	108.4	9034	90.3		
Pastured Cropland	601.6	60.2	6018	60.2	and the second	
Other Field Crops	9984	202.7	943	45.0	338	50.7
Vegetables	1005	41.5	1412	171,8	1783	23.7
Orchards						
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	NOOFOE	1999.2	35000	606.8	2121	74.4
Total Herbicides, In					13/925	2000.4

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	24161	2092	1901	3993
1969	23890	1894	1932	3826
1972	24600	2500	2100	4500

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 33258
Nutrients in Wet Manure: Nitrogen, tons 166
Phosphorus, tons 47
Potash, tons 126

#### TABLE 3--MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	44102	18155	25947			
1969	33588	14379	19209			
1972	36700	15600	21100			
Wet Manure Per Anima		13.14	6,45			
Wet Manure Tons, 197		204984	136095			

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	59875	
1969	53361	1961
1972	43300	7297
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	69713	93256
Nutrients in Wet Manure: Nitrogen, Tons	975	643
Phosphorus, Tons	146	93
Potash, Tons	697	560

# TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		138533		
1969		126/00		
1972		124900		
Wet Manure Facto	r: Lbs. per bird	02.9		
	ated: Tons, 1972	5177		
Nutrients in Wet Manure: Nitrogen, tons		61	Combined	
	Phosphorus, tons Potash, tons	21		

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 494720 (1)	Number I-V farms 971
Number of farms 1699 Acres in farms 200203	Acres in I-V farms 207514 Cropland I-V farms 103697
Cropland in farms 190810 Harvested cropland in farms 120019	Harvested cropland I-V farms 113387

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	42159	5325	1191	6518
GRAINS	26268	2933	39	2972
Wheat	13173	1671	33	1704
Oats	12335	1178	3	1181
Barley	235	55	2	24
Rye	199	16	0	16
OTHER FIELD CROPS	10519	689	90	779
Soybeans	10181	681	20	701
Potatoes	338	9	70	79.
Sugar beets				01/27
Field beans	1653	la la	0	14
HAY OR GRASS SILAGE	31315	605	7	612
PASTURED CROPLAND	19936	191	2	193
Cropland used for pasture	17773	158	2	160
Improved pasture	2163	33	0	33
VEGETABLES, SWEET CORN, MELONS	1875	415	56	471
ORCHARDS	641	67	5	72
BERRIES	64	10	0	10
NURSERY & GREENHOUSE PRODUCTS	81	14	0	14
OTHER CROPS	83	9	0	9
Total Fertilizer Used, Tons		10262	1390	11652
Percent of Fertilizer Used		88	1.2	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

TABLE / FERTILIZER	USED IN 1972	TABLE	APPLIED	vioya anoicam	ALDRI
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	15660	Year	Government Cost/Shared	Government Cost/Shared	Total
Liquid	2983	1972	3628	2372	5000
Total	18643				
Primary Nutrients in		100	nages for oth	er Recent Yea	18
Fertilizer	9135				-
Nitrogen	3015				
Phosphorus	2923				
Potash	3197				

### TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	8127	26.8
1971-72	6665	22.1
1972-73	9879	30,6
	mated Tons Applied on All Hi	

#### TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides 1999.2	Insec 606.8	ticides	Fungicides	Total 2680,4	
Manure: Kind of		Tons of Materials in Wet Manur			e Defecated	
Livestock		Manure	Nitrogen	Phosphorus	Potash	
Swine: Table	2	33258	166	47	120	
Cattle: Tabl	e 3	341079	1910	341	1705	
Sheep: Table	4	69713	975	146	697	
Horses: Tabl	e 4	93256	643	93	500	
Chickens: Ta	able 5	5177	81	21	18	
Turkeys: Tab	ole 5					
Total from Li	vestock,	542483	3775	648	3106	

Fertilizers:	Tons of	Commercial Fer	tilizers Applie	d
		Primary Nutrients		
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	18643	3015	2923	3197

Lime: Limestone equivalent purchased or applied, tons:

Salts: Applied on all highways, tons: Table 9 14320

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms (kg) Hectare (ha) Kilograms (kg) 0.453 ,4047 907,2

# Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: [c i a...
PLANNING SUBAREA: Nort west 4.1 COUNTY: Wayne

TARLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	3510	96.9	780	11.7		
Grains	1470	7.4	490	4.9		
Hay or Grass Silage	793	7.9	661	6.6		
Pastured Cropland	594	5.9	594	5.9		
Other Field Crops	7000	140.0	438			
Vegetables	1961	50,6	1471	183.7	1846	47.8
Orchards			2			
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	15327	308.3	1414.514	217.2	1846	47.8
Total Herbicides, In					21607	573.3

2MANURE	

	Hog & Pig	Number So		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	4546	319	307	626
969	1584	151	155	306
1972	1600	200	200	400

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 2892
Nutrients in Wet Manure: Nitrogen, tons 1h
Phosphorus, tons 4
Potash, tons 11

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	3704	1594	2110			
1969	2328	787	1541			
1972	2600	900	1700			
Wet Manure Per Anim	Factor: Tons	13.14	6.45			
Wet Manure Defecated: Tons, 1972		11826	10965			

Wet Manure Defecated: Tons, 1972 Combined: 22791
Nutrients in Wet Manure: Nitrogen, tons 128
Phosphorus, tons 23
Potash, tons 114

### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	339	
1969	500	669
1972	400	6755
Wet Manure Factor: Tons per animal	1.61	12.78
wet Manure Defecated: Tons, 1972	644	86329
Nutrients in Wet Manure: Nitrogen, Tons	9	596
Phosphorus, Tons	1	86
Potash, Tons	6	518

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		1,01,28		
1969		19428 32362		
1972		35500		
Wet Manure Fac	tor: Lbs. per bird	82.9		
mar radiiure Del	acated: Tone 1079	1471		
Nutrients in W	et Manure:		Combined	
	Nitrogen, tons	23		
	Phosphorus, tons	6		
	Potash, tons	5		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 387200	Number I-V farms 251
Number of farms 597	Acres in I-V farms 35788
Acres in farms 49527	Cropland I-V farms 30123
Cropland in farms 38887	Harvested cropland
Harvested cropland in farms 25%2	I-V farms 20728

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	4111	586	135	721
GRAINS	2278	382	1	383
Wheat	1711	254	1	255
Oats	979	115	0	116
Barley				
Rye	6	2	0	2
OTHER FIELD CROPS	5972	456	52	508
Soybeans	8960	1/51	52 52 0	503
Potatoes	1.3	3.	0	3
Sugar beets				
Field beans				
HAY OR GRASS SILAGE	1906	29	0	29
PASTURED CROPLAND	1692	B	0 .	8
Cropland used for pasture	1606	B	0	8
Improved pasture	86	0	0	0
VEGETABLES, SWEET CORN, MELONS	2068	500	43	543
ORCHARDS	345	166	0	40
BERRIES	35	8	0	6
NURSERY & GREENHOUSE PRODUCTS	611	339	5	341
OTHER CROPS	. 83	1	0	1
Total Fertilizer Used, Tons		2353	233	2586
Percent of Fertilizer Used		93.	9	1.00

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

INDUC / FERT INTER	APPLIED				
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	3476	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	662	1972	0	300	500
Total	4138			er Recent Yea	
Primary Nutrients in Fertilizer	2028	100	nages for our	er wecemt rea	-
Nitrogen	669	-			-
Phosphorus	649				
Potash	710				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71	58306	68.3
1971-72	37869	44,3
1972-73	41498	414.2
Total Esti	mated Tons Applied on All R mited 80189	ighways in 1972-73,

TABLE TO SUMMARY OF ACRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1 308.3		Insec	ticides	Fungicides	70tal 573.3
Manure: Kind of Livestock			f Materials Nitrogen	in Wet Manure	
Swine: Table Z	2092	mure.	14	i inospiiorus	11
Cattle: Table 3	22791		128	23	110
Sheep: Table 4	644			1	6
Horses: Table 4	86329		996	86.	518
Chickens: Table 5	1471		23	6	5
Turkeys: Table 5					
Total from Livestock, Tons	11/127		770	120	694
Fertilizers:	Tons	of Co	umercial Fe	rtilizers Appli	ed
	-		Pric	mary Nutrients	
Item	Tota	d.	Nitrogen	Phosphorus	Potasi
Applied on Cropland: Table 7	4138		669	649	710

To Convert From

Pounds (1b) Acres (scre) Tons (ton) To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0,453 ,4047 907.2

Salts: Applied on all highways, tons: Table 9 60189

# 7.2.2.1 Agricultural Chemicals

Chemical usage is relatively low because the major crops in this planning subarea use primarily herbicides (75 percent of the total) with much less use of insecticides (19 percent) and fungicides (6 percent). The fungicides are used primarily on the vegetable crops. This general pattern will likely continue to prevail. It is projected that chemical usage in this planning subarea may increase 15-25 percent in the next 10 years—herbicide use nearer the top range and fungicides use nearer the bottom range. For 1972 the amount of chemicals used totalled 1,071,340 kilograms (2,359,790 lbs).

# 7.2.2.2 Animal Wastes

Livestock intensity as measured by manure production, is about the same as the Basin average. One factor, very significant in the urban and surrounding areas, is the growth in horse population. Horses produced 20 percent of the livestock manure in Planning Subarea 4.1—the highest percent for any Basin subarea. Livestock manure levels are projected to increase slightly, but will remain about the same as the present Basin average. The 1972 amount was 3,261,810 metric tons (3,595,528 tons) of livestock manure.

# 7.2.2.3 Commercial Fertilizers

Commercial fertilizer use is about 15 percent above Basin average. Nitrogen, phosphorus and potash represent 33, 32, and 35 percent respectively, the same as in Planning Subarea 3.2. Overall fertilization rates are expected to increase 15-25 percent in the next 10 years. Nitrogen will likely show the greatest increase. Total commercial fertilizer use in 1972 for this planning subarea was 179,279 metric tons (197,618 tons).

# 7.2.2.4 Lime

Lime usage in this subarea is relatively low and is projected to remain at about this level. In 1972 44,391 metric tons (48,932 tons) of lime was purchased or applied in PSA 4.1. This was the smallest amount used in any subarea in this lake basin.

# 7.2.2.5 Salts

Road de-icing salts are in heavy use in this planning subarea and will continue at these rates because of the large metropolitan areas and subsequent high traffic volume. For the 1972-73 season this area applied 159,320 metric tons (175,619 tons) of salts, nearly one-third of the total for the entire lake basin.

# 7.3 Planning Subarea 4.2

This subarea encompasses three northeast Indiana counties and twenty northwest Ohio counties. This is corn belt country. While only four counties in the subarea directly border on Lake Erie, a number of others are on the Maumee River.

# 7.3.1 Agricultural Characteristics

This land has fertile loamy soils with large acreages devoted to the production of corn. In addition, 88 percent of the soybean acreage in the Lake Erie basin is in this planning subarea. Vegetable production is also very significant. Tomatoes and sweet corn comprise about 70 percent of the vegetable acreage.

Table 7-16 indicates the relative proportions of materials usage in Planning Subarea 4.2 in comparison with the total Great Lakes Basin.

Table 7-16

MATERIALS USAGE BASIN RELATIONSHIP -- PSA 4.2 TO GREAT LAKES

Per harvested acre of cropland	Planning Subarea 4.2	Great Lakes Basin
Lbs of chemicals applied Index of chemicals applied	2.09 79	2.66 100
Tons of livestock manure defecated Index of manure defecated	1.66 49	3.37 100
Lbs primary nutrients in livestock manu Index primary nutrients in manure	ire 43 52	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	343 28 107	321 22 100
Lbs primary nutrients in commercial fer Index primary nutrients in commercial fe		153 100
Lbs of lime applied Index of lime applied	161 95	170 100
Per acre of total land area Lbs road salts used Index road salts used	36.39 87	41.74 100
	rams (kg)	Multiply By 0.454 907.2 0.907

# 7.3.2 Materials Usage

Table 7-17 lists by county the material usage inventory for PSA 4.2. Detailed statistics are shown on Tables 7-18 to 7-41.

Table 7-17

MATERIALS USAGE
(in 1972)

PSA 4.2	Chemicals Applied to Crops (100 1bs)	Livestock Manure (tons)	Commercial Fertilizer on Cropland (tons)	Limestone Purchased or Applied (tons)	Salts Applied to all Highways (tons)
Indiana					
Adams	3,060	378,189	32,229	8,390	3,242
Allen	4,434	388,081	41,234	10,245	8,450
DeKalb	2,160	231,312	22,400	4,842	4,489
Ohio					
Allen	2,732	231,867	20,610	9,071	3,350
Auglaize	3,223	485,589	27,183	10,532	3,771
Crawford	2,686	330,599	25,543	28,266	4,129
Defiance	2,706	168,043	15,757	7,492	2,524
Erie	2,096	130,792	13,586	14,889	3,967
Fulton	3,841	439,657	57,046	13,725	5,562
Hancock	4,520	279,900	31,286	13,019	3,118
Henry	4,243	197,682	37,693	903	5,076
Huron	3,658	241,664	24,950	12,739	4,414
Lucas	2,128	83,122	13,477	9,970	10,262
Mercer	4,072	744,322	34,961	25,547	3,626
Ottawa	2,026	85,937	11,648	3,009	7,325
Paulding	3,364	74,096	15,809	7,673	1,813
Putnam	4,555	352,690	34,110	16,737	2,886
Sandusky	4,117	246,745	34,189	4,897	6,817
Seneca	4,133	323,914	15,723	28,094	5,439
VanWert	4,167	116,936	33,784	6,556	2,480
Williams	2,795	322,171	26,908	10,061	5,149
Wood	5,568	236,694	54,458	11,721	13,757
Wyandot	3,259	222,947	26,692	48,431	3,524
TOTAL	79,543	6,312,949	651,276	306,809	115,170
	To Convert	From	To	Multip	1у Ву
	Pounds (1 Tons (ton	1) K	ilograms (kg) ilograms (kg) etric Tons	907.	454 2 907

Agricultural Chemicals, Manures, Fertilizers, Lime and Righway De-Icing Compounds

STATE: Indiana and Ohio PLANNING AREA: Lake Erie 4.0 PLANNING SUBAREA: Southwest 4.2

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herb	lcides	Insect	Insecticides		cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres	Amount Used
Corn	1239784	34092.9	275509	4131.8		
Grains	424348	2120.8	141449	1413.3		
Hay or Grass Silage	78480	784.8	65400	653.4	-	
Pastured Cropland	51907	517.9	51907	517.9		
Other Field Crops	1353760	27075.2	84610	845.4		The state of the s
Vegetables	37963	1223.1	37963	1763.0	37963	2179.3
Orchards						17.00
Berries	hash	208.6	4692	844.1	4830	1171.3
Nursery, Greenhouse						
Other Crops						
Totals			661530		1,2793	3350.6
Total Herbicides, In	secticide	s. Fungio	ides: 10	0 lbs	3801,680	70512 8

TARTE	2MANTIRE	TOOM.	CLITAIN	

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	7914157	81128	75082	156210
1969	817643	70705	68151	138856
1972	915783	75784	79316	155100

Wet Manure Factor: Tons per litter rarrow.
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	1,97091	151/178	3h2913			
1969	410536	127078	283458 261042			
1972	434031	172989	261042			
Wet Manure Per Anima	Factor: Tons	13.14	6.45			
Wet Manure   Tons, 197		2273075	1683721			
Wet Manure   Nutrients in	Defecated: Tons, 1972 n Wet Manure: Nitroge Phospho Potash,	n, tons 2215 rus, tons 3957	9			

Year	Item	Sheep &	Horses & Ponies
1964		231831	
1969		196220	11:355
1972		165112	41193
Wet Manure Factor: 7	Cons per animal	1.61	12.78
Wet Manure Defecated:	Tons. 1972	1.61 265830	12.78 526447
Nutrients in Wet Manu	ire: Nitrogen, Tons	3722	3632
	Phosphorus, Tons	588	526
	Potash Tons	9658	3759

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		5370303		
1969		60247111		
1972		6169919	216710	2115600
Wet Manure Fac	tor: Lbs. per bird	82.9	365.0	89.63
not radiure Dete	ecated: Tone 1079	268181		
Nutrients in W	Nitrogen, tons	4183	Combined 1	096
	Phosphorus, tons Potash, tons	1073 939		37 70

COUNTY: 23 County Totals TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	6328768	Number I-V farms	21/916
Number of farms	35551	Acres in I-V farms	5088858
Acres in farms	5629811	Cropland I-V farms	11100615
Cropland in farms	4791741	Harvested cropland	
Harvested cropland in farms	3802981	I-V farms	3558708

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	1139759	177563	5057/1	228077
GRAINS	711999	88635	5252	93887
Wheat	147216	61333	1,005	65338
Oats	253057	26278	1221	27502
Barley	1716	152	6	158
Rye	7302	661	16	677
OTHER FIELD CROPS	1/11078	511/1/7	551.7	5699h
Soybeans	1357618	35982	3228	39270
Potatoes	4278	2480	29	2509
Sugar beets				1
Field beans	29339	1111	5	116
HAY OR GRASS SILAGE	250552	5754	240	5994
PASTURED CROPLAND	203558	23/12	82	2/12/1
Cropland used for pasture	182517	2090	55	2115
Improved pasture	21041	252	27	279
VEGETABLES, SWEET CORN, MELONS	14572	14810	2250	17060
ORCHARDS	5473	956	51	1007
BERRIES	329	93	14	107
NURSERY & GREENHOUSE PRODUCTS	758	281	62	346
OTHER CROPS	3573	172	52 16	188
Total Fertilizer Used, Tons		342167	64033	1,06200
Percent of Fertilizer Used		811	16	100

TABLE 7-FERTILIZER I		Z TABLE	APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	470820	Year	Government	Government Cost/Shared	Total Tomage
Liquid	180456	1972			306809
Total	651276		names for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	331826	100	nages for our	er necent lea	10
Nitrogen	103808				
Phosphorus	105889				
Potash	122129				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	79406	
	ted Tons Applied on All Hi	ghways in 1972-73,

TABLE 10 -- SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1 66023.3	les	Ins	ecticides 8.9	Fungicides 3350.6	79542.8
Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3	1161	Manure 675		ls in Wet Manure en Phosphorus 1651 4098	
Sheep: Table 4 Horses: Table 4 Chickens: Table 5	2658 5264 2681	147 81	3722 3632 4183	588 519 1073	2658 3117 939
Turkeys: Table 5 Total from Livestock, Tons	134020 6312949		2109 42514	541 8470	32088
Fertilizers:	To	ns of		Fertilizers Appli	ed
Item	To	tal	Nitrogen	Imary Nutrients Phosphorus	Potash
Applied on Cropland: Table 7	65127	6	103808	105889	122129
Lime: Limestone equiv Table 8 3068		purchas	sed or appl	led, tons:	

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: Indiana PLANNING AREA: Lake Erie 4.0 PLANNING SUBAREA: Southwest 4.2 COUNTY: Adams

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	119954	1373.7	11101	166.5		
Grains	12870	64.3	1290	42.9		
Hay or Grass Silage	3390	33.9	2825	28.2		
Pastured Cropland	2524	25.2	2524	25.2		
Other Field Crops	56240	1124.8	3515	35.1		
Vegetables	1021	39.1	1021	15.7	1021	74.3
Orchards						
Berries	26	1.6	27	3.1	28-	6.8
Nursery, Greenhouse						
Other Crops						
Totals	126025	2662.6	25303	316.7	1049	81.1

TABLE 2--MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year		Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	hh571	14136	3927	8363
1969	551.82	4589	4369	8959
1972	(1) 83877	6890	6701	13591

Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons 115
Potash, tons 394

(1) Hog & Pig Inventory not shown for Indiana. Number estimated in same TABLE 3—MANURE FROM CATTLE proportion as litters farrowed.

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved				
1964	23786	8942	14844			
1969	18251	7042	11209			
1972	(1) 19462	(1) 7509	(1) 11953			
Wet Manure Per Anima	Factor: Tons	13.14	6.45			
Wet Manure Tons, 19		98668	77097			
		ogen, tonsphorus, tons	175765 984 176 879			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	5649	
1969	3926	1223
1972	(1) 3416	1223 4660
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	5500	59555
Nutrients in Wet Manure: Nitrogen, Tons	77	10.1
Phosphorus, Tons	12	60
Potash, Tons	55	357

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	436705	1000	
1969			
1972	668549 (1) 556834	16720	167200
Wet Manure Factor: Lbs. per bird	82.9	365.0	89.63
Wet Manure Defecated: Tons, 1972	23081	2024	U7.8U3
Nutrients in Wet Manure: Nitrogen, tons	360	Combined	10507
Phosphorus, tons	92		42
Potash, tons	81		37

(1) 1972 County figures: State trends applied to each county as county figure not available for 1972.

To Convert From Pounds (1b) Acres (acre) Tons (ton)

Kilograms (kg) Hectare (ha) Kilograms (kg)

0.453 .4047 County, land area, acres includes water areas under 40 acres in size.

		Table 8	390	
9	Salts:	Applied on	all highways,	tons:
27	8			
		Multi	plv Bv	

TABLE 6CROP ACREAGES & FERTILIZES	USEDCLA	SS I-V CEN	ISUS FARMS,	1969
COUNTY, land area, acres (1) 220800		ber I-V fa	rms 1147 farms 1873	
Number of farms         1514           Acres in farms         204537           Cropland in farms         173631	Cro		farms 1612	
Harvested cropland in farms 139482			farms 1317	15
	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	45691	6519	2081	8600
GRAINS	21436	2540	152	2692

	Crop	Tons o	f Fertilize:	r Used
Crops	Acres	Dry	Liquid	Total
CORN	45691	6519	2081	8600
GRAINS	21436	6519 2540	152	2692
Wheat	12215	1611	126	1737
Oats	9159	924	26	950
Barley	21		0.	2
Rye	36	3	0	3
OTHER FIELD CROPS	51,069	1322	119	11/1/1
Soybeans	53961 47	1294	111	1405
Potatoes	47	23	0	23
Sugar beets				
Field beans	850	4	0	14
HAY OR GRASS SILAGE	9820	333	21	354
PASTURED CROPLAND	10094	210	7	217
Cropland used for pasture	9503	207	5	212
Improved pasture	591	3	2	164
VEGETABLES, SWEET CORN, MELONS	1245	433	31	464
ORCHARDS	27	0	0	0
BERRIES	7	0	0	0
NURSERY & GREENHOUSE PRODUCTS	1	0	0	0
OTHER CROPS	396	1 1	0	1
Total Fertilizer Used, Tons		11362	2411	13773
Percent of Fertilizer Used		82	18	100

(Fall & Spring 1973 Tonnage Reports)	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	20512	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	11717	1972	625	7765	8390
Total	32229			er Recent Yea	
Primary Nutrients in		LOI	mages for oth	let Metent tea	15
Fertilizer	158lili				
Nitrogen	1676				_
Phosphorus	5206				
Potach.	E062				

(1) Full year information available

for only 1973.
TABLE 9--SALTS APPLIED TO PEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2235	
Total Est As Com	imated Tons Applied on All Hi puted 32h2	ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	s In	secticides	Fungicides	Total
Table 1	2662.6		316.7	81.1	3060.1
Manure: K	ind of	Ton	s of Materia	ls in Wet Manure I	Defecated
Livestock		Manur	e Nitrog	en Phosphorus	Potash
Swine: Tal	ble 2	103781	519 984	145	394
Cattle: T	able 3	175765	984	176	879
Sheep: Table 4		5500	77	12	55
Horses: Table 4		59555	h11	60	357
Chickens: Table 5		23081	360	92	81
Turkeys: Table 5		10507	164	42	37
Total from Livestock, Tons		378189	2515	527	1803
Fertilizer	s:	Tons of	Commercial	Fertilizers Applie	ed
			Pr	imary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7		32229	4676	5206	5962
	estone equiva	lent purch	ased or appl	ied, tons:	

Total

Tonnage

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Indiana PLANNING SUBAREA: Southwest 4.2 COUNTY: Allen

Potash

	Herbicides		Insecticides		Fungicides	
Crop Group or Grops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	77810	2139.7	17291	259.3		
Grains	24323	121.6	8108	81.0		
Hay or Grass Silage	3540	35.4	2950 3564	29.5		
Pastured Cropland	3564	35.6	3564	35.6		
Other Field Crops	79120	1582.4	4945	49.4		
Vegetables	247	9.5	2117	3.8	247	18.0
Orchards						
Berries	83	6.2	85	9.9	89	17.3
Nursery, Greenhouse						
Other Crops						
Totals	188687	3930.4	37190	L68.5	336	35.3

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	55480	6283	5617	11900
1969	63553	5466	5139	10605
1972	(1) 80306	6416	6985	13401

Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons 7.636 102330 Phosphorus, tons 1/13 Potash, tons

(1) County Hog & Pig Inventory not shown--calculated at same ratio as litters

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	28011	9034	18977		
1969	22856	7235	15621		
1972	171/1/2	6567	10875		
Wet Manure F Per Animal	actor: Tons	13.14	6.45		
Wet Manure D Tons, 1972		86290	7032/2		

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	10/132	
1969	68111	2030
1972	(1) 5954	7731
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	9586	98841
Nutrients in Wet Manure: Nitrogen, Tons	1,34	682
Phosphorus, Tons	20	99
Potash, Tons	96	593

Potash, tons

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	463095		
1969	1439635		
1972	(1) 366172	9090	90900
Wet Manure Factor: Lbs. per bird	82,90	365.0	89.63
Met Manure Defecated: Tons, 1972	82.90 15178		1190100
Nutrients in Wet Manure:		Combined	5712
Nitrogen, tons	237		89
Phosphorus, tons	61		23
Potash, tons	53		50

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	129372	Number I-V farms	1501
Number of farms	2310	Acres in I-V farms	276018
Acres in farms	316619	Cropland I-V farms	234085
Cropland in farms	264052	Harvested cropland	2000
Harvested cropland in farms	205596	I-V farms	187763

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	65453	9139	3555	12694
GRAINS	39153	9139 4151	1452 340	4603
Wheat	22239	2676	340	3016
Oats	16487	11/1/2	111	1553
Barley	40	5	0	15
Rye	255	20	2	22
OTHER FIELD CROPS	71559	2208	324	2532
Soybeans	70724	1969	312	2281
Potatoes	351	151	0	151
Sugar beets				
Field beans	783	1	1	2
HAY OR GRASS SILAGE	11882	239	8	21/7
PASTURED CROPLAND	11,256	239 11:1	3	21/1
Cropland used for pasture	13283	132	3	135
Improved pasture	973	9	0	9
VEGETABLES, SWEET CORN, MELONS	301	133	18	151
ORCHARDS	58	7	0	7
BERRIES	43	3	0	3
NURSERY & GREENHOUSE PRODUCTS	187	143	3	146
OTHER CROPS	306	0	0	0
Total Fertilizer Used, Tons		16165	4364	20529
Percent of Fertilizer Used		79	21	100

(1) TABLE 7-FERTILIZER USED IN 1973 TABLE 8-GROUND LIMESTONE EQUIVALENT (Spring 1973 Fertilizer Tonnage Reports-ingular) Tons Tonnage Tonnage not Tonnage Tonnage not Fertilizer Used Government Cost/Shared Government 28680 on Crops: Solid Liquid Year Cost/Shared 12554 41234 1972 1103 91h2
Tonnages for Other Recent Years Total Primary Nutrients in 19500 5508 6473 Fertilizer Nitrogen Phosphorus

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	5826	
Total Estima	ted Tons Applied on All Hig	hways in 1972-73,

ADI D 10 STRANADY OF ACRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides 3930.4		secticides 468.5	Fungicides 35.3	Total
	d of	Ton	s of Material	ls in Wet Manure	Defecated
Livestock	(A)	Manur	and the same of th		Potash
Swine: Tabl		102330	512	1/13	389
Cattle: Tab		156434	876	156	782
Sheep: Tabl		9586	134	20	96
Horses: Tab		98841	682	99 61	593 53
Chickens: T		15178	237		
Turkeys: Ta		5712	89	23	20
Total from L Tons		388081	2530	502	1933
Fertilizers:		Tons of	Commercial 1	Fertilizers Applie	ed
			Pri	imary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on C	ropland:	41234	5508	6473	7519

Lime: Limestone equivalent purchased or applied, tons: Table 8 10245

Salts: Applied on all highways, tons: Table 9 8450

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Indiana PLANNING SUBAREA: Southwest 4.2 COUNTY: DeKalb

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres	Amount Used
Corn	40391	1110.7	8976	134.6		
Grains	11761	58.8	3920	39.2		
Hay or Grass Silage	31,80	34.8	2900	29.0		
Pastured Cropland	2633	26.3	2633	26.3		
Other Field Crops	33360	667.2	2085	20.8		
Vegetables	97	3.7	97	1.5	97	7.1
Orchards						1 ****
Berries						
Nursery, Greenhouse						
Other Crops						
Totals Total Herbicides, In	91722	1901.5	20611	251.4	97	7.1

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig Inventory	Dec. 1-May 31	June 1-Nov. 30	
Year	Dec. 1	Spring	Fall	Total
1964	27878	2950	2765	5715
1969	27580	2505	2509	5014
1972 (1	37300	3018	3763	6781

0107
7.636
51780
259
72
197

(1) 1972 Hog & Pig Inventory by Co Calculated at same ratio

		Number Cattl	e and Calves
Year	Tota1	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964 1969	21732	8983	12749
1972	18014 14527	6427 7335	11587
Wet Manure F Per Animal	actor: Tons	13.14	6.45
Wet Manure I Tons, 1972		96382	46388
Wet Manure I Nutrients in		1972 Combined: 11 trogen, tons 80 osphorus, tons 11 tash, tons 71	3

#### TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	8987	
1969	5910	50.
1972	(1) 51/12	564 2149
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	8279	27464
Nutrients in Wet Manure: Nitrogen, Tons	116	190
Phosphorus, Tons	17	27
Potash, Tons	83	165

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		83062		
1969		29504		
1972	(	1) 24574		
Wet Manure Facto	or: Lbs. per bird	82.9		
Wet Manure Defe	cated: Tons, 1972	1019		
Nutrients in Wet	Manure: Nitrogen, tons	16	Combined	
	Phosphorus, tons Potash, tons	4		

applied to county as county figures for 1972 not available.

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	231,01,8	Number I-V farms 716
Number of farms	1313	Acres in I-V farms 151313
Acres in farms	190065	Cropland I-V farms 123321
Cropland in farms	151686	Harvested cropland
Harvested cropland in farms	97296	I-V farms 8h172

	Crop	Tons	of Fertilize	T Used
Crops	Acres	Dry	Liquid	Tota
CORN	27063	3619	1003	1,622
GRAINS	17918	2027	3/15	2169
Wheat	11300	1387	119	1506
Oats	5903	590	22	612
Barley	20	13	0	3
Rye	526	30	1	31
OTHER FIELD CROPS	29264	91.7	167	1111
Soybeans	291.03	881	167	1048
Potatoes	151	65	0	65
Sugar beets	1000			1
Field beans				
HAY OR GRASS SILAGE	9847	294	3	297
PASTURED CROPLAND	10532	118	2	120
Cropland used for pasture	9356	99	2	101
Improved pasture		19		
VEGETABLES, SWEET CORN, MELONS	1176	31	5	19 36
ORCHARDS	5	0	0	0
BERRIES	1	0	0	0
NURSERY & GREENHOUSE PRODUCTS	3	0	0	0
OTHER CROPS	969	8	1	0
Total Fertilizer Used, Tons	0.1100	7044	1323	8367
Percant of Fertilizer Used		84	16	100

(From Spring 1973 Fe Report for Indiana)	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	14325	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid Total Primary Nutrients in Fertilizer	8075 22400	1972 Ton	3110 nages for Oth	1732 er Recent Yea	1,81,2 rs
Nitrogen	3950				
Phosphorus	3158				
Potash	4332				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	3095	
Total Estimat	ed Tons Applied on All Hi	ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides 1901.5		ecticides	Fungicides	Total
18016 1	1301.2	25	1.4	. 7.1	2160.0
Manure: Kind	of	Tons	of Materials	in Wet Manure De	efecated
Livestock		Manure			
Swine: Table	2 5	1.780	259	72	197
Cattle: Table	3 11	12770	800	143	714
Sheep: Table	4 82	279	116	1.7	83
Horses: Table	4 2	7464	190	27	83
Chickens: Tab	le 5 10	019	16	1	14
Turkeys: Tabl	e 5				
Total from Liv Tons		31312	1381	263	1163
Fertilizers:		Tons of	Commercial Fer	tilizers Applied	
10-1-1-1			Prima		
Item		Total	Nitrogen	Phosphorus	Potasi
Applied on Cro	pland:	22400	3950	3158	4332

Lime: Limestone equivalent purchased or applied, tons: Table  $-8 - \frac{h8h2}{}$ 

Salts: Applied on all highways, tons: Table 9 1489

To Convert From

Kilograms(kg) Hectare (ha) Kilograms (kg) Pounds (1b) Acres (acre) Tons (ton)

To

Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Pertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Ohio COUNTY: Allen PLANNING SUBAREA: Southwest 4.2

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS.	1972

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres	Amount Used
Corn	1438814	1206.8	9752	146.2		
Grains	16162	80.8	5387	53.8		
Hay or Grass Silage	2010	20.1	1675	16.7	(O-1	
Pastured Cropland	21/88	24.8	2488	24.8		
Other Field Crops	53040	1060.8	3315	33.1		
Vegetables	381	12.2	381	18.1	381	21.7
Orchards						
Berries	22	1.1	24	4.4	25	6.3
Nursery, Greenhouse						0.0
Other Crops						
Totals	117987	2406.6	23022	297.1	1:06	28.0
Total Herbicides, In	secticide	s, Fungio	ides: 10	0 1bs	141415	2731.7

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	37221	3889	3703	7592
1969	34938	3138	2980	6318
1972	36100	3097	3224	6321

Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons 7.45 Phosphorus, tons\_ Potash, tons\_

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	21957	5901	16056
1969	16367	5901 4060	12307
1972	17600	4536	13064
Wet Manure Per Anima	Factor: Tons	13.14	6.45
Wet Manure Tons, 197		59603	84263
Wet Manure Nutrients i	Defecated: Tons, n Wet Manure: Ni	1972 Combined: 11 trogen, tons 8	<u>13866</u> 06
	Ph	osphorus, tons	19

## TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2011/3	
1969	7824	679
1972	6700	1300
Wet Manure Factor: Tons per animal	1.61	12.78
wet Manure Defecated: Tops, 1972	10787	16614
Nutrients in Wet Manure: Nitrogen, Tons	151	115
Phosphorus, Tons	23	17
Potash, Tons	108	100

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	214815		
1969	288422		
1972	325917		
Wet Manure Factor: Lbs. per bird	82.9		
rediture Deterated, Tone 1072	82.9 13509		
Nutrients in Wet Manure: Nitrogen, tons	210	Combined	
Phosphorus, tons	5/4		
Potash, tons	147		es :

TABLE 6--CROP ACREAGES & FERTILIZER USED-

COUNTY, land area, acres	1) 2621111	Number I-V farms 1040
Number of farms	1611	Acres in I-V farms 190259
Acres in farms	215862	Cropland I-V farms 161369
Cropland in farms	183745	Harvested cropland
Harvested cropland in far	rms 150169	I-V farms 137519

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	1,650h	71415	1511	8956
GRAINS	1650L 28031	3681	87	3768
Wheat	17706	2536	67	2603
Oats	1,0038	1119	20	1139
Barley	Til.	1	0	14
Rye	238	22	0	22
OTHER FIELD CROPS	56076	1573	89	1662
Soybeans	55065	1330	48	1378
Potatoes	16	15	0	15
Sugar beets				-
Field beans	909	6	0	6
HAY OR GRASS SILAGE	6978	96	0 .	96
PASTURED CROPLAND	8912	96 51	0	96 51 41
Cropland used for pasture	8061	1/1	0	117
Improved pasture	851	10	0	10
VEGETABLES, SWEET CORN, MELONS	1/33	107	2	109
ORCHARDS	23	1	0	1
BERRIES	6	1		1
NURSERY & GREENHOUSE PRODUCTS	34	14	0	h
OTHER CROPS	158	12	2	14
Total Fertilizer Used, Tons		12977	1691	11,668
Percant of Fertilizer Used		88	12	100

TABLE /FERTILIZER	USED IN 1972	TABLE	APPLI
Item	Tons		Tonnag
Fertilizer Used on Crops: Solid	11488	Year	Governme Cost/Sha
Liquid	6122	2070	
Total	20610	1972	
Primary Nutrients in Fertilizer	10191	1971	nages for
Nitrogen	3261	1973	
Phosphorus	3325		
Potash	3605		

TABLE 7--PERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

Year	Tonnage Tonnage not Government Government or Cost/Shared Cost/Shared		Total Tonnage
1972			9071
Ton	nages for Oth	er Recent Yea	TS
1971			11661
1973			18297

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2310	
Total Est As Com	imated Tons Applied on All H	ighways in 1972-73,

Table 1	Herbicides 2406.6		7.1	Fungicides 28.0	Total 2731.7
Manure: Kind				in Wet Manure I	
Livestock		Manure			Potasi
Swine: Table	2	17097		66	179
Cattle: Tabl	e 3	143866	235 806	144	719
Sheep: Table		10787	151	23	108
Horses: Tabl		16614	115	17	100
Chickens: Ta	ble 5	3509	210	514	47
Turkeys: Tab	le 5				
Total from Li Tons		31867	1517	304	1153
Fertilizers:		Tons of	Commercial Fer	tilizers Applie	d
			Prima	ry Nutrients	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on Cr Table 7	opland: 2	0610	3261	3325	3605

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 3350

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Ohio PLANNING SUBAREA: Southwest 4.2 COUNTY: Auglaize

Phosphorus Potash

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres	Amount Used	Acres	Amount Used
Corn	57812	1589.8	12817	192.7		
Grains	17992	89.9	5997	59.9		
Hay or Grass Silage	6330	63.3	5275	52.7		
Pastured Cropland	33/13	33.4	33/13	33.4		
Other Field Crops	501.80	1009.6	3155	31.5		
Vegetables	1013	13.2	1413	19.7	413	23.5
Orchards	19	.9	21	3.8	22	5.3
Berries						202
Nursery, Greenhouse						_
Other Crops						
Totals	136389	2800.1	27.007	393.7	435	28.8

TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1,6306	5187	1519	9706
1969	57251	5348	5467	10815
1972	62800	CR12	6050	11863

Potash, tons

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964 1969 1972	30162 30211	12160 11591 198h5	18302 18623			
Wet Manure I Per Animal		13.14	14855			
Wet Manure I Tons, 1972		260763	95815			
Wet Manure I Nutrients in	Defecated: Tons, 1972 Wet Manure: Nitroge Phospho Potash,	n, tons 1997 rus, tons 357	8			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	11135	
1969	10419	572
1972	9100	573 1150
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	14651	
Nutrients in Wet Manure: Nitrogen, Tons	205	18531 128
Phosphorus, Tons	31	19
Potash, Tons	147	111

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey	Turkeys
1964	203735		
1969	153666		-
1972	173643	400	1,000
Wet Manure Factor: Lbs. per bird	82.9	365	89.63
wet Manure Defecated: Tons 1977	7198	202	09.03
Nutrients in Wet Manure: Nitrogen, tons	112	Combined	252
Phosphorus, tons Potash, tons	29	-	1

TABLE 6-- CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, Number of farms	acres	255936 1760	Number I-V farms Acres in I-V farms	1215
Acres in farms		250428	Cropland I-V farms	
Cropland in farms_		211516	Harvested cropland	
Harvested cropland	in farms	166017	I-V farms	154782

Crops	Crop Acres	Tons	of Fertilize	Tot	
CORN	52273	8074	1634	9708	
GRAINS	33192	3854		1128	
Wheat	16790	2230	274	2375	
Oats	16108	1605	127	1732	
Barley	109		0	10	
Rye	152	10	2	10	
OTHER FIELD CROPS	18663	1377	95	11/72	
Soybeans	48591	1368	95	1463	
Potatoés	2	1	0	1	
Sugar beets				1	
Field beans	1873	1h	0	14	
HAY OR GRASS SILAGE	19760	575	46	621	
PASTURED CROPLAND	12716	182	9	191	
Cropland used for pasture	11531	167	7	174	
Improved pasture	1185	15	2	17	
VEGETABLES, SWEET CORN, MELONS	1,69	82	89	171	
ORCHARDS	25	0	0	0	
BERRIES	1	0	0	0	
NURSERY & GREENHOUSE PRODUCTS	40	10	0	10	
OTHER CROPS	0	0	0	0	
Total Fertilizer Used, Tons		14168	21/17	16315	
Percent of Fertilizer Used		87	13	100	

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT (July 1, 1972-June 30, 1973) Item Tons APPLIED Tonnage Tonnage not Fertilizer Used Government on Crops: Solid Year Cost/Shared Cost/Shared Tonnages for Other Recent Years Total Primary Nutrients in Fertilizer Nitrogen 13497 3644 4800 5053

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS Tons Purchased Tons Applied Per Year Through State

Year

1970-71
1971-72
1972-73
2600
Total Estimated Tons Applied on All Highways in 1972-73,
As Computed 3771

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides		ticides	Fungicides	Total
Table 1	2800.1	393.	7	28.8	3222.6
Manure: Kin	d of	Tons o	f Materials	in Wet Manure De	fecated
Livestock		Manure	Nitrogen	Phosphorus	Potas
Swine: Tabl	e 2	88379	11/15	121	336
Cattle: Tab	le 3	356578	1997	357	1783
Sheep: Tabl	e 4	14651	205	31	147
Horses: Tab	le 4	18531	128	19	211
Chickens: T	able 5	7198	112	29	25
Turkeys: Ta	ble 5	252	1k	1	17
Total from L Tons		485589	2888	561	2403
Fertilizers:		Tons of Co	mmercial Fe	rtilizers Applied	

Fertilizers:	Tons of	Commercial Fer	tilizers Applie	d
		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	27183	3644	4800	5053

Lime: Limestone equivalent purchased or applied, tons: Table 8 10532

Salts: Applied on all highways, tons: Table 9 3771

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograma (kg) Multiply By 0.453 .4047 907.2

(1) County, land area, acres includes water areas under 40 acres in size.

Tonnage

				TUSHING.	-	and the spirit of the spirit of the spirit of		
Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Ohio PLANNING SUBAREA: Southwest 4.2 COUNTY: Crawford

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS	1972

	Herbi	cides	Insect	icides	Fung	icides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	14552	1225.1	9900	148.5		
Grains	17016	85.0	5672	56.7		
Hay or Grass Silage	3690	36.9	3075	30.7		
Pastured Cropland	h193	41.9	4193	11.9		
Other Field Crops	49360	987.2	3085	30.8		
Vegetables	8	.3	8	.li	8	.5
Orchards				-		
Berries						
Nursery, Greenhouse						
Other Crops						
Totals	118819	2376.4	05022	200.0	0	-
Total Herbicides, In				309.0	31/1/760	2685.9

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	51417	4660	14892	9552
1969	51297	4339	3913	8252
1972	55100	4344	4520	8864

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964 1969	27h/1 21h31	7745	19696		
1972	23400	6098	15333 17163		
Wet Manure Per Anima	Factor: Tons	13.14	6.45		
Wet Manure 1		81.954	110701		
Wet Manure Nutrients in		72 Combined: 1926 ogen, tons 1079 phorus, tons 193 sh, tons 963			

### TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	27489	
1969	21,986	715
1972	21300	715 2495
Wet Manure Factor: Tons per animal	1.61	12.78
wet Manure Defecated: Tons, 1972	34293	31,886
Nutrients in Wet Manure: Nitrogen, Tons	180	550
Phosphorus, Tons	72	32
Potash, Tons	3143	191

#### TABLE 5-MANURE FROM CHICKENS & THEREYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		120805		
1969		130805 122295		
1972		138193		
Wet Manure Fact	or: Lbs. per bird	82.9		
THE SIMILE DELL	CSTRES TAKE 1079	5728		
Nutrients in We	t Manure: Nitrogen, tons	89	Combined	
	Phosphorus, tons	23		
	Potash, tons	20		-

### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS

COUNTY, land area, acres	1) 258560	Number I-V farms 1019
Number of farms	1504	Acres in I-V farms 212779
Acres in farms	237730	Cropland I-V farms 178303
Cropland in farms	194601	Harvested cropland
Harvested cropland in far	rms 149378	I-V farms 11,072h

	Crop	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	
CORN	50139	7800	1855	9655
GRAINS	29609	3927	153	1,080
Wheat	19208 9923		105	2822
Oats	9923	2717	105	1196
Barley	33 1407	5	0	16
Rye	1,07	45	-6	452
OTHER FIELD CROPS	1493148	1258	176	51 11/31/
Soybeans	48920	2271	153	1.32/1
Potatoes	1	0	0	0
Sugar beets				
Field beans	1230	2	0	9
HAY OR GRASS SILAGE	1230	2	2	118
PASTURED CROPLAND	16128	129	0	129
Cropland used for pasture	14645	112	0	112
Improved pasture	1483	17	0	27
VEGETABLES, SWEET CORN, MELONS	9	0	0	0
ORCHARDS	14	0	0	0
BERRIES	5	0	0	0
NURSERY & GREENHOUSE PRODUCTS	50	9	0	9
OTHER CROPS	60	9 26	0	26
Total Fertilizer Used, Tons		13267	2186	15453
Percent of Fertilizer Used		86	211	100

TABLE 7-FERTILIZER USED IN 1972 (July 1, 1972-June 30, 1973)		TABLE 8-GROUND LIMESTONE EQUIVALENT APPLIED			
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	18943	Year	Government	Government Cost/Shared	Total Tonnage
Liquid	6600	1972			28266
Total	25543		nages for Dri	er Recent Yes	
Primary Nutrients in Fertilizer	12113	1971			1,5000
Nitrogen	3403	1973			39508
Phosphorus	4021				
Potash	1,689				

#### TABLE 9-- SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year Through State		Tons Applied Per		
1970-71				
1971-72				
1972-73	2847			
Total Estima	ated Tons Applied on All Hi	ghways in 1972-73,		

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide 2376.4	s Inse	cticides	Fungicides	Total 2685.9	
alial and his country and				in Wet Manure De		
Manure: Kind of Livestock		Kanure	Nitrogen		Potash	
Swine: Table 2		66037	330	92	251	
Cattle: Tab	de 3	192855		193	963	
Sheep: Tabl	R 4	34293	1480	72	31/3	
Horses: Tah	1e 4	31886	223	32	191	
Chickens: Table 5		5328	89	23	20	
Turkeys: Ta	ble 5					
Total from L Tons		330599	2198	102	1768	
Fertilizers:		Tons of C		ilizers Applied		
		Primary Nutrients				
Ites		Total	Nitrogen	Phosphorus	Potash	
Applied on C Table 7	roplands	255143	3403	1,021	L689	

To Convert From

Pounds (1b) Acres (scre) Tons (ton)

70 Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0,453 907-2

Salts: Applied on all highways, tons: Table 9 4129

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: Ohio PLANNING AREA: Lake Erie 4.0 PLANNING SUBAREA: Southwest 4.2 COUNTY: Defiance

Potash

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	33485	920.8	71/11	111.6		
Grains	20615	103.0	6872	68.7		
Hay or Grass Silage	1860	18.6	1550	15.5		
Pastured Cropland	2005	20.0	2005	20.0	53731 3	
Other Field Crops	6112110	1284.8	4015	40.1		
Vegetables	361	11.5	361	17.2	361	20.5
Orchards						
Berries	119	8.2	124	20,2	131	25.5
Nursery, Greenhouse						1000
Other Crops						
Totals	122685	2366.9	22368	293.3	1192	46.0

TARTE	2MANI	TRE	FROM	SWINE

	Hog & Pig		ws Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	18262	1922	1925	381.7	
1969	22757	1976	1791	3767	
1972	21,600	1995	2077	上072	

Wet Manure Factor: Tons pe	r litter farrowed	7.45	
Wet Manure Defecated: Tons,	1972	30336	
Nutrients in Wet Manure: N	itrogen, tons	152	
P	hosphorus, tons	75	
P	otash, tons	115	

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	15315	5259	10056			
1969	10797	3747	7050 6297			
1972	11400	5103	6297			
Wet Manure   Per Anima	factor: Tons	13.14	6.45			
Wet Manure 1 Tons, 197		67053	40616			
			9			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	371/4	
1969	2864	653
1972	1900	1239
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	3059	15834
Nutrients in Wet Manure: Nitrogen, Tons	43	109
Phosphorus, Tons	6	16 95
Potash, Tons	31	95

TABLE 5--MANURE FROM CHICKENS & THREEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	171645		
1969	237936		
1972	268868		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	111/15		
Nutrients in Wet Manure: Nitrogen, tons	174	Combined	
Phosphorus, tons	45		
Potash, tons	39		

TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	263680	Number I-V farms	870
Number of farms	1375	Acres in I-V farms	199429
Acres in farms	230420	Cropland I-V farms	166910
Cropland in farms	1.88220	Harvested cropland	
Harvested cropland in farms	140297	I-V farms	127835

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	28503	4143	9/13	5086
GRAINS	30137	3379	122	3501
Wheat	17238	2177	86	2263
Oats	12219	1128	36	1164
Barley	2	0	0	0
Rye	501	58	0	58
OTHER FIELD CROPS	58374	1455	88	1543
Soybeans	57675	1195	56	1251
Potatoes	314	178	12	190
Sugar beets	The same of			
Field beans	3494	7	0	7
HAY OR GRASS SILAGE	8439	230	0	230
PASTURED CROPLAND	7582	96	0	96
Cropland used for pasture	6897	86	0	86
Improved pasture	685	1.0	0	10
VEGETABLES, SWEET CORN, MELONS	410	148	7	155
ORCHARDS	98	7	0	7
BERRIES	50	50	0	50
NURSERY & GREENHOUSE PRODUCTS	0	0	0	0
OTHER CROPS	40	1	0	1
Total Fertilizer Used, Tons		91,66	1160	10676
Percent of Fertilizer Used		89	11	100

TABLE 7--FERTILIZER USED IN 1972

(July 1, 1972-June 3b, 1973)
Item Tons

Table 8--GROUND LIMESTONE EQUIVALENT
APPLIED

Tonnage Tonnage Tonnage Not Tonnage Fertilizer Used on Crops: Solid Liquid Government 12249 Year Cost/Shared Cost/Shared 1972 Total
Primary Nutrients in
Fertilizer
Nitrogen
Phosphorus Tonnages for Other Recent Years 1973

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72	Carlos III III III III III III III III III I	
1972-73	1740	

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Chemicals:	Hune	areaweight	Applied on Cro	ppiano		
Herbicide		s Insecticides		Fungicides	Total	
Table 1	ble 1 2366.9		3.3	46.0	2706.2	
Manure: Kind of		Tons	of Materials	in Wet Manure D	efecated	
Livestoc	k	Manure	Nitrogen	Phosphorus	Potash	
Swine: Tab	le 2	30336	152	42	11.5	
Cattle: Ta	ble 3	107669	603	108	538	
Sheep: Tab	le 4	3059	43	6	37	
Horses: Ta	ble 4	15834	109	16	95	
Chickens:	Table 5	11145	174	45	39	
Turkeys: 1	Table 5					
Total from Ton		168043	1081	217	818	
Fertilizers	11	Tons of		rtilizers Applie	d	
			Prima	ary Nutrients		
Ite	m	Total	Nitrogen	Phosphorus	Potash	
Applied on Table 7	Cropland:	15757	2574	2521	2840	

Lime: Limestone equivalent purchased or applied, tons: Table 8 7492

Salts: Applied on all highways, tons: Table 9 2524

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 .4047 907.2

(1) County, land area, acres includes water areas under 40 acres in size.

Tonnage not

Tonnage

7492

Government

Agricultural	Chemicals,	Manures,	Fertilizers.	Lime	and	Highway	De-Icing	Compound

PLANNING AREA: Lake Erie 4.0 STATE: Ohio PLANNING SUBAREA: Southwest 4.2 COUNTY: Erie

TABLE 1 PETIMATED AMOINTS OF CHEMICALS HEED ON CROPS 1072

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres	Amount Used
Corn	1,9939	548.3	14431	66.4		
Grains	7685	38.4	2562	25.6		
Hay or Grass Silage	1560	15.6	1300	13.0		
Pastured Cropland	858	8.5	858	8.5		
Other Field Crops	20320	406.4	1270	12.7		
Vegetables	3/129	109.7	31129	163.2	3429	194.9
Orchards					Control of the contro	
Berries	878	42.2	1011	185.2	1037	257.4
Nursery, Greenhouse		/		-		
Other Crops						
Totals	51,669	1169.1	11,861	1174.6	14466	452.3
Total Herbicides, In					73996	2096.0

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sov	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	7943	796	732	1527
1969	7108	793	663	1456
1972	7400	743	773	1516

Nutrients in Wet Manure: Nitrogen, tons

Phosphorus, tons Potash, tons\_

TABLE 3--MANURE FROM CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	8085	3842	142143
1969	8212	3604	1,608
1972	9000	5481	3519
Wet Manure   Per Anima	Factor: Tons	13.14	6.45
Wet Manure 1 Tons, 1977		72020	22698
Wet Manure   Nutrients in	Defecated: Tons, 1972 n Wet Manure: Nitroge Phospho Potash,	en, tons 530 orus, tons 95	1.8

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	3346	
1969	3346 2489	437
1972	2000	1425
Wet Manure Factor: Tons per animal	1.61	12.78
wet Manure Defecated: Tons, 1972	3220	1,8212
Nutrients in Wet Manure: Nitrogen, Tons	145	126
Phosphorus, Tons	7	18
Potash, Tons	32	109

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		77745		
1969		721,77		
1972		80769		
Wet Manure Fact	or: Lbs. per bird	82.9		
not non ure Dete	cated: Tone 1072	3348		
Nutrients in We	Manure: Nitrogen, tons	52	Combined	
	Phosphorus, tons	13		
	Potash, tons	12		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	168832	Number I-V farms	433
Number of farms	702	Acres in I-V farms	92909
Acres in farms	106733	Cropland I-V farms	78360
Cropland in farms	86970	Harvested cropland	- 10
Harvested cropland in farms	72534	I-V farms	59834

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	18879	3753	632	4385
GRAINS	14290	1821	73	1894
Wheat	9942	1297	66	1363
Oats	3944	488	7	1.95
Barley	107	17	0	17
Rye	265	15	0	15
OTHER FIELD CROPS	17215	1340	137	1477
Soybeans	15198	723	1,14	767
Potatoes	36	114	7	21
Sugar beets				
Field beans	82	0	0	0
HAY OR GRASS SILAGE	82 4862	273	1 -	274
PASTURED CROPLAND	3719	273 53	0	53
Cropland used for pasture	2894	37	0	37
Improved pasture	825	16	0	16
VEGETABLES, SWEET CORN, MELONS	3897	1112	85	1197
ORCHARDS	1222	161	0	161
BERRIES	23	15	0	5
NURSERY & GREENHOUSE PRODUCTS	2l <sub>4</sub> 221	9	1	10
OTHER CROPS	221	9 55	0	10 55
Total Fertilizer Used, Tons		8582	929	9511
Percent of Fertilizer Used		90	10	100

Fertilizer Used on Crops: Solid 13586 Total
Primary Nutrients in
Fertilizer
Nitrogen Phosphorus Potash

TABLE 7--FERTILIZER USED IN 1972

(July 1, 1972-June 3d, 1973)

Item Tons Tonnace Tonnace not Tonnage Tonnage not Government Government
Year Cost/Shared Cost/Shared Total Tonnage Tonnages for Other Recent Years
1971
1973 14889 22667

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2735	
Total Estim	ated Tons Applied on All H	ighways in 1972-73,

	Herbicides		secticides	Fungicides	Total
Table 1	1169.1	1 47	4.6	452.3	2096.0
Manure: Kind	of _	Tons	of Materials	in Wet Manure D	efecated
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Table		1294	56 530	16	1/13
Cattle: Table		4718	530	95	1:74
Sheep: Table		220	45	7	32
Horses: Table		8212	126	18	109
Chickens: Tab	ole 5	348	52	13	12
Turkeys: Tabl	le 5				
Total from Liv Tons	westock,	30792	809	149	670
Fertilizers:		Tons of		rtilizers Applie	d
			The second secon	ary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on Cro	opland:	3586	1884	2063	2882

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Salts: Applied on all highways, tons: Table 9 3967

Corn Grains

Crop Group

Crops

## GREAT LAKES BASIN MATERIAL USAGE INVENTORY Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: Ohio

COUNTY: Fulton

COUNTY, land area, acres (1) Number of farms

 Acres in farms
 239839

 Cropland in farms
 207129

 Harvested cropland in farms
 166959

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

 260288
 Number I-V farms
 1281

 1738
 Acres in I-V farms
 220818

 239839
 Cropland I-V farms
 193765

Harvested cropland I-V farms 158538

Lake Erie 4.0

Fungicides
Amount
Acres Used

Treated 100 lbs

Acres

PLANNING SUBAREA: Southwest 4.2

PLANNING AREA:

Acres

Treated

Insecticides

Amount Used 100 1bs

256.6

11.0 18.0 11.1 27.9 117.8

Acres (acre)

Tons (ton)

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

Amount Used 100 lbs

Herbicides

Acres

Treated

				4107	41.0	_				10	rop	Tong	of Fertiliz	boot we
	ss Silage	2160	21.6	1800	18.0			Canada			cres	Dry	Liquid	Tota
	ropland	1119	11.1	1119	11.1	-	-	Crops						
ther Fiel		141610	892.8	2790	27.9	2474	140.6	CORN		7751 2242	13	111162	4777	18939
egetables		2474	79.1	2474	117.8	2414	740.0	GRAINS		22/12	27	3270	154	3hsh
rchards			1 0	22	77.0	- 00	22.9	Wheat		1621		2541	139	2680
erries		86	4.8	96	17.0	99	26.07	Oats		5468	3	663	1.3	676
rsery, Gr					-	_	-	Barley		66		6	1	7
ther Crop	8	-	-	-	-	-	-	Rye		628		59	0	59
-						-		OTHER FIELD CROPS		4805		3059	127	3186
			_		-			Soybeans		4670	08	shho	92	2532
				-	+			Potatoes		838		528	2	530
				ant at	1.00 1	oran	163.5	Sugar beets						
otals	icides, In	139787	37.88.0	2911911	100 15-1	2573 171854	3840.9	Field beans		80		0	1	1
otal nero	icides, in	secticide	ss, rungi	cides:	100 108	1 1/1024	1 3040.2	HAY OR GRASS SILAGE		8521 425		258	0	258
ADTE 2 M	ANURE FROM	CUTNE						PASTURED CROPLAND				65	7	72
ADLE ZP	MNUKE FROM	SWIME						Cropland used for p	asture	3990	)	60	7	67
	Hog & Pig		Number So	we Farm	wine			Improved pasture		264		5	0	5
	Inventory		1-May 31		L-Nov. 30			VEGETABLES, SWEET COF	N, MELONS	2811		1003	266	1269
Year	Dec. 1		ring		Fall	Tot	al	ORCHARDS		103		11	0	11
110000		4		1				BERRIES		724		3	0:	3
1964	56784		82		4554	903		NURSERY & GREENHOUSE	PRODUCTS	27		1	0	1
1969	71393	36	552 342		3488	711		OTHER CROPS		50		1	0	1
1972	78400	38	342		3999	784	1	Total Fertilizer Used				21833	5332	2716
et Manure	Factor:	Tons per	litter f	arrowed	17.	15		Percent of Fertilizer	Used			80	20	100
	Defecated			4110000	58	415								
	in Wet Mar			ons		72		TABLE 7FERTILIZER U	SED IN 1972	TABLE	E 8GROU	UND LIM	MESTONE EQUIV	ALENT
utilents	THE WELL THAT		osphorus,		82			[(July 1, 1972-June 3			APPI	LIED	AND DESCRIPTION OF THE PARTY OF	ALCOHOL:
			tash, ton			22		Item	Tons				Tonn	-
		10	caons con	-	- 65	c.le.					Tonna		Tonnage not	To bot
								Fertilizer Used	balla?		Govern		Government	Total
TABLE 3	MANURE FROM	CATTLE						on Crops: Solid	33706	Year	Cost/Si	nared	Cost/Shared	Tonnage
								Liquid	23340	1972				13725
				Numb	er Cattle	and Calves	S	Total	570/16	Tor	nnages fo	or Othe	er Recent Yea	ITS
			0	lows & H			s, Steers,	Primary Nutrients in		1971				21772
Year	Tot	tal	1 2	Cal			s, Calves	Fertilizer	27219	1973				15252
								Nitrogen	10015			-		
1964		224		593		39293		Phosphorus	6943					
1969		548		634		33208		Potash	10261					
1972	1 42	1400	-	737		35029	1							
Wet Manure	e Factor:	Tons									mm gover		MANUTATINA III	MHEAVE
Per Anir				13.	1/4	6.45		TABLE 9SALTS APPLI	ED TO FEDERA	L, STA	TE, COUN	TY, 8 1	MUNICIPAL HI	GHWAID
Commence of the last of the la		12				-			27 1	-		-		
Wet Manure	e Defecate	d:		968		2259	277		Tons Purcha			Tons /	Applied Per	
													E" Mile	
Tons, 1	972			700	22	5677,	21	Year	Through St	ate		-		
Tons, 1		d: Tons,	1972 Con				21		Through St	ate				
Tons, 19	972 e Defecate in Wet Ma			mbined:	322792 1808		21	1970-71	Through St	ate				
Tons, 19	e Defecate	nure: Ni		mbined:_	322792		21	1970-71 1971-72		ate				
Tons, 19	e Defecate	nure: Ni	trogen, tosphorus,	nbined:_ tons_ tons_	322792 1808 323		21	1970-71 1971-72 1972-73	3835		Highway			
Tons, 19	e Defecate	nure: Ni	trogen, t	nbined:_ tons_ tons_	322792 1808		21.	1970-71 1971-72 1972-73 Total Estimated T	3835 ons Applied		Highway			
Tons, 1 Wet Manur Nutrients	e Defecate in Wet Ma	nure: Ni	trogen, to nosphorus, otash, tor	mbined: tons tons	322792 1808 323		21	1970-71 1971-72 1972-73	3835 ons Applied		Highway			
Tons, 1 Wet Manur Nutrients	e Defecate	nure: Ni	trogen, to nosphorus, otash, tor	mbined: tons tons	322792 1808 323		21	1970-71 1971-72 1972-73 Total Estimated T	3835 ons Applied		Highway			
Tons, 1 Wet Manur Nutrients	e Defecate in Wet Ma	nure: Ni	trogen, to nosphorus, otash, tor	mbined: tons tons	322792 1808 323 161h			1970-71 1971-72 1972-73 Total Estimated T	3835 ons Applied		Highway			
Tons, 1' Wet Manure Nutrients TABLE 4	e Defecate in Wet Ma	nure: Ni Pt Pc	trogen, to nosphorus, otash, tor	mbined: tons tons	322792 1808 323 161h	& Hor	ses &	1970-71 1971-72 1972-73 Total Estimated T As Computed	3835 ons Applied 5562	on All		s in 19	972-73,	
Tons, 1 Wet Manur Nutrients	e Defecate in Wet Ma	nure: Ni	trogen, to nosphorus, otash, tor	mbined: tons tons	322792 1808 323 161h	& Hor		1970-71 1971-72 1972-73 Total Estimated T	3835 ons Applied 5562	on All		s in 19	972-73,	
Tons, 1' Wet Manure Nutrients TABLE 4	e Defecate in Wet Ma	nure: Ni Pt Pc	trogen, to nosphorus, otash, tor	mbined: tons tons	322792 1808 323 1614 Sheep Lambs	& Hor	ses &	1970-71 1971-72 1972-73 Total Estimated T As Computed	3835 ons Applied 5562 F AGRICULTURA	on All	ERIALS A	s in 19	972-73, HWAY DE-ICING	,
Tons, 1' Wet Manur Nutrients  TABLE 4 Year 1964	e Defecate in Wet Ma	nure: Ni Pt Pc	trogen, to nosphorus, otash, tor	mbined: tons tons	322792 1808 323 1614 Sheep Lambs	& Horn	ses &	1970-71 1971-72 1972-73 Total Estimated T As Computed	3835 ons Applied 5562 F AGRICULTURA Hundredweigh	on All	ERIALS A	s in 19	972-73, HWAY DE-IGING	
Tons, 19 Wet Manure Nutrients  TABLE 4  Year  1964 1969	e Defecate in Wet Ma	nure: Ni Pt Pc	trogen, to nosphorus, otash, tor	mbined: tons tons	322792 1808 323 161h Sheep Lambs 4532 2922	& Horr	ses & nies	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:	3835 ons Applied 5562 F AGRICULTURA Hundredweigh ides I	on All	erials and ied on C	nd High	972-73,  HWAY DE-ICING	Total
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972	e Defecate in Wet Ma	nure: Ni Pt Pc M SHEEP /	trogen, tosphorus, tash, tor	mbined: tons tons	322792 1808 323 161h Sheep Lambs 4532 2922 2200	8 Horr Poi	ses & nies	1970-71 1971-72 1972-73 Total Estimated T As Computed	3835 ons Applied 5562 F AGRICULTUR/ Hundredweigh ides I	on All AL MATE t Appl insecti	ERIALS AN	nd High Croplan Fur	972-73,  HWAY DE-ICING d mgicides 63.5	Total 3840.9
Tons, 1' Wet Manur Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manur	e Defecate in Wet Ma MANURE FRO e Factor:	nure: Ni Ph Pc M SHEEP #	trogen, to sphorus, otash, tor	mbined: tons tons	322792 1808 323 1614 Sheep Lambs 4532 2922 2200 1.61	8 Horr Poi 670 15 12	ses & nies	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:	3835 ons Applied 5562 F AGRICULTUR/ Hundredweigh ides I	on All AL MATE t Appl insecti	ERIALS AN	nd High Croplan Fur	972-73,  HWAY DE-ICING	Total 3840.9
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Wet Manure	e Defecate in Wet Ma MANURE FRO e Factor: e Defecate	Tons per d: Tons,	trogen, tosphorus, otash, tor	mbined:_cons . tons_ns_	322792 1808 323 1614 Sheep Lambs 4532 2922 2200 1.61	8 Horr Poi 57: 15: 12: 19:	ses & nies 0 38 .78 656	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188.  Manure: Kind of	3835 ons Applied 5562  F AGRICULTUR Hundredweigh ides I O To	on All AL MATE t Appl nsecti 189.4	ERIALS ANderial	ND HIGH Croplan Fur 10	972-73,  HWAY DE-ICING d mgicides 63,5	Total 3840.9 fecated Potash
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Wet Manure	e Defecate in Wet Ma MANURE FRO e Factor:	Tons per d: Tons, nure: Ni	trogen, tosphorus, otash, tor	mbined:_cons tons_ns_s	322792 1808 323 161h Sheep Lambs 4532 2922 2200	670 670 15 12 190 13	ses & nies 0 38 .78 656 656 65	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188.  Manure: Kind of Livestock	3835 ons Applied 5562  F AGRICULTUR. Hundredweigh ides I 0 To Manu	on All AL MATE t Appl nsecti 189.4	erials and ded on Codes	ND HIGH Croplan Fur 10	972-73,  HWAY DE-ICING d mgicides 63.5	Total 3840.9 fecated Potash
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Wet Manure	e Defecate in Wet Ma MANURE FRO e Factor: e Defecate	Tons per d: Tons, nure: Ni	trogen, toosphorus, otash, tor	mbined: cons tons ss	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 33h2 50 7	8 Horr Poi 57: 15: 12: 19: 13: 20	ses & nies 0 38 .78 656 6	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188.  Manure: Kind of Livestock Swine: Table 2	3835 ons Applied 5562  F AGRICULTURA Hundredweigh ides I 0 To Manu 58415	on All AL MATE t Appl nsecti 189.4	ERIALS ANderial	ND HIGH Croplan Fur 10	972-73,  HWAY DE-ICING d ingicides 63.5 fet Manure De Phosphorus 82	Total 3840.9 fecated Potasi
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Wet Manure	e Defecate in Wet Ma MANURE FRO e Factor: e Defecate	Tons per d: Tons, nure: Ni	trogen, tosphorus, otash, tor	mbined: cons tons ss	322792 1808 323 1614 Sheep Lambs 4532 2922 2200 1.61	670 670 15 12 190 13	ses & nies 0 38 .78 656 6	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188.  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3	3835 ons Applied 5562  F AGRICULTURA Hundredweigh ides I 0 To Manu 58115 322792	on All AL MATE t Appl nsecti 189.4	ied on Codes  Material Nitroge 292 1808	ND HIGH Croplan Fur 10	972-73,  HWAY DE-ICING d mgicides 63,5 let Manure De Phosphorus	Total 3840.9 fecated Potasi 222 1614
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Wet Manure	e Defecate in Wet Ma MANURE FRO e Factor: e Defecate	Tons per d: Tons, nure: Ni	trogen, toosphorus, otash, tor	mbined: cons tons ss	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 33h2 50 7	8 Horr Poi 57: 15: 12: 19: 13: 20	ses & nies 0 38 .78 656 6	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of  Chemicals:  Herbic Table 1 3188*  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4	3835 ons Applied 5562  F AGRICULTURA Hundredweigh ides I 0 To Manu 58115 322792	on All AL MATE t Appl nsecti 189.4	ied on Codes  Material Nitroge 292 1808	ND HIGH Croplan Fur 10	972-73,  d mgicides 63.5 let Manure De Phosphorus 82 323 7	Total 3840.9 fecated Potasi 222 1614
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Wet Manure Nutrients	e Defecate in Wet Ma MANURE FRO e Factor: e Defecate	Tons per dd: Tons, per houre: NA	animal 1972 animal, Torgen, To	mbined: cons tons s s Gons , Tons , Tons ss	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 33h2 50 7	8 Horr Poi 57: 15: 12: 19: 13: 20	ses & nies 0 38 .78 656 6	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188* Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 4	3835 ons Applied 5562  F AGRICULTURA Hundredweigh ides I 0  To Manu 58415 322792 3542 19656	on All AL MATE t Appl nsecti 189.4	erials avied on Cides  Material Nitroge 292 1808 50 136	ND HIGH Croplan Fur 10	972-73,  HWAY DE-ICING d mgicides 63,5 let Manure De Phosphorus 82 323 7 20	Total 3840.9 fecated Potasi 222 1644 35
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Wet Manure Nutrients	e Defecate in Wet Ma MANURE FRO e Factor: e Defecate in Wet Ma	Tons per dd: Tons, per houre: NA	animal 1972 animal, Torgen, To	mbined: cons tons s s Gons , Tons , Tons ss	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 33h2 50 7	8 Horr Poi 57: 15: 12: 19: 13: 20	ses & nies 0 38 .78 656 6	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188.  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 4 Chickens: Table 5	3835 ons Applied 5562  F AGRICULTUR Hundredweigh ides I 0 To Manu 98415 322792 3542 19056 26534	on All AL MATE t Appl nsecti 189.4	ied on Cides Material Nitroge 292 1808 50 136 hili	ND HIGH Croplan Fur 10	972-73,  HWAY DE-ICING d mgicides 63.5 let Manure De Phosphorus 82 323 7 20 106	Total 3840.9 fecated Potasi 222 1644 35 118 93
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Wet Manure Nutrients	e Defecate in Wet Ma MANURE FRO e Factor: e Defecate in Wet Ma	Tons per dd: Tons, per houre: NA	animal 1972 animal, Torgen, To	mbined: cons tons s s Gons , Tons , Tons ss	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 33h2 50 7	8 Horr Poi 57: 15 12 19: 13: 20	ses & nies 0 38 .78 656 6	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY OF Chemicals:  Herbic Table 1 3188.  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 4 Chickens: Table 5 Turkeys: Table 5	3835 ons Applied 5562  F AGRICULTUR Hundredweigh ides I 0	on All AL MATE t Appl nsecti 189.4	erials avied on Cides  Material Nitroge 292 1808 50 136	ND HIGH Croplan Fur 10	972-73,  HWAY DE-ICING d mgicides 63,5 let Manure De Phosphorus 82 323 7 20	Total 3840.9 fecated Potash 222 1644 35
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Wet Manure Nutrients	e Defecate in Wet Ma MANURE FRO e Factor: e Defecate in Wet Ma	Tons per dd: Tons, per houre: NA	canimal 1972 trogen, Toophorus, otash, tor	nbined: tons tons ss	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 33h2 50 7	8 Horr Poi 15 12 19 13 20 11	ses & nies 0 38 .78 656 6	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Off Chemicals:  Table 1 3188.  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 4 Chickens: Table 5 Turkeys: Table 5 Total from Livestock	3835 ons Applied 5562  F AGRICULTURA Hundredweigh ides I 0  To Manu 58415 322792 3512 19656 26531 8718	on All  AL MATH t Appl nsecti	Material Nitroge 292 1808 50 136 1411 136	ND HIGH Croplan Fur 10	972-73,  WAY DE-ICING d ingicides 63.5 et Manure De Phosphorus 82 323 7 20 106 35	Total 3840.9 fecated Potast 222 1614 35 118 93 31
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Wet Manure Nutrients  TABLE 5  Year	e Defecate in Wet Ma MANURE FRO e Factor: e Defecate in Wet Ma	Tons per d: Tons, nure: NAMERP #	canimal 1972 trogen, Toophorus, otash, tor	nbined: tons tons ss Tons Tons Tons Tons ss EYS	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 35h.2 50 7 35	8 Horr Poi 57: 15 12 19: 13: 20	ses & nies 0 38 .78 656 6	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188, Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 4 Chickens: Table 5 Turkeys: Table 5 Total from Livestock Tons	3835 ons Applied 5562  F AGRICULTURA  Hundredweigh ides I 0  To Manu 58415 322792 3542 19656 26534 8718 , 439657	on All AL MATH t Appl nsecti [489.] ns of	Material Nitroge 292 1808 50 136 hili 136 2836	ND HIGH Croplan Fu 10 s in W	972-73,  WAY DE-ICING d mgicides 63.5 let Manure De Phosphorus 82 323 7 20 106 35	Total 3840.9 fecated Potasi 222 1614 35 118 93 31
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Wet Manure Nutrients  TABLE 5  Year  1964	e Defecate in Wet Ma MANURE FRO e Factor: e Defecate in Wet Ma	Tons per d: Tons, nure: NAMERP #	canimal 1972 trogen, Toophorus, otash, tor	tons tons tons tons tons tons tons tons	322792 1808 323 1611  Sheep Lambs 1532 2922 2200 1.61 3512 50 7 35	8 Horr Poi 15 12 19 13 20 11	ses & nies 0 38 .78 656 6	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Off Chemicals:  Table 1 3188.  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 4 Chickens: Table 5 Turkeys: Table 5 Total from Livestock	3835 ons Applied 5562  F AGRICULTURA  Hundredweigh ides I 0  To Manu 58415 322792 3542 19656 26534 8718 , 439657	on All AL MATH t Appl nsecti [489.] ns of	Material Material Material Mitroge 292 1808 50 136 hill 136 2836	ND HIGH Croplan Fur 10 s in Wen	972-73,  HWAY DE-ICING d mgicides 63.5 fet Manure De Phosphorus 82 323 7 20 106 35 573 Zeers Applied	Total 3840.9 fecated Potasi 222 1614 35 118 93 31
Tons, 1 Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Nutrients  TABLE 5  Year 1964 1969	e Defecate in Wet Ma MANURE FRO e Factor: e Defecate in Wet Ma	Tons per d: Tons, nure: NAMERP #	canimal 1972 trogen, Toophorus, otash, tor	rons Tons Tons Tons Tons Tons Tons Tons T	322792 1808 323 161h  Sheep Lambs 4532 2922 2200 1.61 3512 50 7 35	670 670 155 122 159 133 200 111	ses & nies  0 38 .78 656 6 8 Turkeys	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188, Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 4 Chickens: Table 5 Turkeys: Table 5 Total from Livestock Tons	3835 ons Applied 5562  F AGRICULTUR Hundredweigh ides I 0 To Manu 98415 322792 3542 19056 26534 8718 , 439657 Tons o	on All AL MATH t Appl nsecti 189.1	Material Material Nitroge 292 1808 50 136 hill 136 2836	ND HIGH Croplan Fun 10 s in Wen	972-73,  HWAY DE-ICING d mgicides 63,5 let Manure De Phosphorus 82 323 7 20 106 35 573 lzers Applied	Total 3840.9 Fecasted Fotasi 222 1614 35 118 93 31
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972  Year  1964 1969 1972	e Defecate in Wet Ma  MANURE FRO  e Factor: e Defecate in Wet Ma  MANURE FRO	Tons per di Tons nure: NAMERP di Tons per di Tons nure: NAMERP di Tons nure: NAMER di	trogen, toosphorus, otash, tor  animal 1972 trogen, Toosphorus, otash, Tor	tons tons tons tons tons tons tons tons	322792 1808 323 161h  Sheep Lambs 4532 2922 2200 1.61 3512 50 7 35	8 Horr Poi 15 12 19 13 20 11	ses & nies 0 38 .78 656 6	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY OF Chemicals:  Herbic Table 1 3188,  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 4 Chickens: Table 5 Turkeys: Table 5 Total from Livestock Tons Fertilizers:  Item	3835 ons Applied 5562  F AGRICULTUR  Hundredweigh ides I 0  To Manu 58415 322792 3542 19656 26534 8718 439657 Tons o Total	on All AL MATH t Appl nsecti 189.1	Material Material Material Mitroge 292 1808 50 136 hill 136 2836	ND HIGH Croplan Fun 10 s in Wen	972-73,  HWAY DE-ICING d mgicides 63.5 fet Manure De Phosphorus 82 323 7 20 106 35 573 Zeers Applied	Total 3840.9 Fecasted Fotasi 222 1614 35 118 93 31
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972  Year  1964 1969 1972	e Defecate in Wet Ma  MANURE FRO  e Factor: e Defecate in Wet Ma  MANURE FRO	Tons per di Tons nure: NAMERP di Tons per di Tons nure: NAMERP di Tons nure: NAMER di	trogen, toosphorus, otash, tor  animal 1972 trogen, Toosphorus, otash, Tor	rons Tons Tons Tons Tons Tons Tons Tons T	322792 1808 323 161h  Sheep Lambs 4532 2922 2200 1.61 3512 50 7 35	670 670 155 12 129 133 200 111	ses & nies 0 38 .78 .656 .656 .656 .656 .656 .656 .656 .65	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188.  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 5 Turkeys: Table 5 Turkeys: Table 5 Turkeys: Table 5 Total from Livestock Tons Fertilizers:  Item Applied on Cropland:	3835 ons Applied 5562  F AGRICULTUR  Hundredweigh ides I 0  To Manu 58415 322792 3512 19656 26534 8718 , 439657 Tons o	on All AL MATH t Appl nsecti 189.1	Material Material 1808 50 136 1116 12836 Pri	ND HIGH Croplan Fur 10 S in W	972-73,  HWAY DE-ICING d mgicides 63.5 let Manure De Phosphorus 82 323 7 20 106 35 573 lzers Applied lutrients Phosphorus	Total 3840.9 Fecated Potasi 222 1604 35 118 93 31 2113
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972  Wet Manure Vear  1964 1969 1972  Wet Manure Wet Manure Vear	e Defecate in Wet Ma MANURE FRO e Factor: e Defecate in Wet Ma	Tons per d: Tons, nure: NAMERP #	c animal 1972 trogen, Tosphorus, trash, tor	Chic Chic Chic Chic Chic Chic Chic Chic	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 351,2 50 7 35	670 670 155 122 159 133 200 111	ses & nies  0 38 .78 656 6 8 Turkeys	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY OF Chemicals:  Herbic Table 1 3188,  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 4 Chickens: Table 5 Turkeys: Table 5 Total from Livestock Tons Fertilizers:  Item	3835 ons Applied 5562  F AGRICULTUR  Hundredweigh ides I 0  To Manu 58415 322792 3542 19656 26534 8718 439657 Tons o Total	on All AL MATH t Appl nsecti 189.1	Material Material Nitroge 292 1808 50 136 hill 136 2836	ND HIGH Croplan Fur 10 S in W	972-73,  HWAY DE-ICING d mgicides 63,5 let Manure De Phosphorus 82 323 7 20 106 35 573 lzers Applied	Total 3840.9 Fecasted Fotasi 222 1614 35 118 93 31
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Nutrients  TABLE 5  Year  1964 1969 1972 Wet Manure	e Pactor: e Pactor: e Pactor: e Defecate in Wet Ma	Tons per dd: Tons, nure: Ni Pr Pc  Item  Tons per dd: Tons, nure: Ni Pr Pc  M CHICKE:  Item  Lbs. per dd: Tons	c animal 1972 trogen, Tosphorus, trash, tor	Chic	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 351,2 50 7 35	8 Horr Poi 15 12 13 20 11 Turkey Hens	ses & nies 0 38 .78 .656 6 8 Turkeys Raised 120000 89.63	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188.  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 5 Turkeys: Table 5 Turkeys: Table 5 Turkeys: Table 5 Turkeys: Table 5 Total from Livestock Tons Fertilizers:  Item Applied on Cropland: Table 7	3835 ons Applied 5562  F AGRICULTUR Hundredweigh ides I 0  To Manu 58415 322792 3542 19656 26534 8718 439657 Tons o Total 57046	on All  AL MATH t Appl nsecti 189.1 ns of re	Material Material Mitroge 292 1808 50 136 hili 136 2836 mercial I Pri Ritrogen 10015	ND HIGH Croplan  Fur  16 8 in Wen  Fertilitimary N	972-73,  HWAY DE-ICING d Ingicides 63.5 let Manure De Phosphorus 82 323 7 20 106 35 573 Izers Applied Butrients Phosphorus 6943	Total 3840.9 Fecated Potasi 222 1604 35 118 93 31 2113
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure  Year  1964 1969 1972 Wet Manure	e Pactor: e Pactor: e Pactor: e Pactor: e Defecate in Wet Ma	Tons per dd: Tons, nure: Nf Pr	r animal 1972 ttrogen, 1 trogen, 1 trogen, 1 tosphorus, 1 tosphorus, 1 trogen, 1 tosphorus, 1 tosphorus, 1 trogen, 1 tosphorus, 1 trogen, 1 tosphorus,	Chic 4857 5664 6401 82.9 2653	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 351,2 50 7 35	8 Horr Poi	ses & nies 0 38 .78 656 656 6 8 Turkeys Raised 120000 89.63 8718	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188.  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 5 Turkeys: Table 5 Total from Livestock Tons Fertilizers:  Ltem Applied on Cropland: Table 7 Lime: Limestone equ	3835 ons Applied 5562  F AGRICULTUR  Hundredweigh ides I 0  To Manu 58415 322792 3512 19656 26534 8718 , 439657 Tons o Total 57046	on All  AL MATH t Appl nsecti 189.1 ns of re	Material Material Mitroge 292 1808 50 136 hili 136 2836 mercial I Pri Ritrogen 10015	ND HIGH Croplan  Fur  16 8 in Wen  Fertilitimary N	972-73,  HWAY DE-ICING d Ingicides 63.5 let Manure De Phosphorus 82 323 7 20 106 35 573 Izers Applied Butrients Phosphorus 6943	Total 3840.9 Fecated Fotas 222 1604 35 118 93 31 2113
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure  Year  1964 1969 1972 Wet Manure	e Factor: e Factor: e Factor: e Defecate in Wet Ma	Tons per d: Tons, per d: Tons per d: Tons per d: Tons nure: Ny Pr Pr d: Tons nure: Ny Pr Pr d: Tons nure: Lbs. per d: Tons nure: trogen, t	e animal 1972 trogen, 1 trogen, 1 trogen, 1 trogen, 1 trospen, 1 t	Chic 4857 5664 414 414	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 351,2 50 7 35	8 Horr Poi	ses & nies  0 38 .78 .656 .6 .6 .8  Turkeys Raised  120000 .89,63 .8718 .336	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188.  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 5 Turkeys: Table 5 Total from Livestock Tons Fertilizers:  Ltem Applied on Cropland: Table 7 Lime: Limestone equ	3835 ons Applied 5562  F AGRICULTUR Hundredweigh ides I 0  To Manu 58415 322792 3542 19656 26534 8718 439657 Tons o Total 57046	on All  AL MATH t Appl nsecti 189.1 ns of re	Material Material Mitroge 292 1808 50 136 hili 136 2836 mercial I Pri Ritrogen 10015	ND HIGH Croplan  Fur  16 8 in Wen  Fertilitimary N	972-73,  HWAY DE-ICING d Ingicides 63.5 let Manure De Phosphorus 82 323 7 20 106 35 573 Izers Applied Butrients Phosphorus 6943	Total 3840.9 Fecated Potasi 222 1604 35 118 93 31 2113
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure  Year  1964 1969 1972 Wet Manure	e Pactor: e Pactor: e Pactor: e Defecate in Wet Ma MANURE FRO	Tons per d: Tons, per d: Tons per d: Tons per d: Tons, per d: Tons, nure: Nf Pr d: Tons, nure: Nf Pr d: Tons, per d: Tons nure: trogen, trogen, trogen, trogen, tonsphorus	r animal 1972 trogen, Tooshorus, translation of the trogen, Tooshorus, translation of the trogen, Tooshorus, translation of translation of the tra	Cons	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 351,2 50 7 35	8 Horr Poi	ses & nies  0 38 .78 .656 .656 .8  Turkeys .Raised  120000 .89.63 .8718 .136 .35	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:    Herbic Table 1 3188.     Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3     Sheep: Table 4     Horses: Table 5     Turkeys: Table 5     Turkeys: Table 5     Total from Livestock Tons     Fertilizers:     Item     Applied on Cropland: Table 7     Lime: Limestone equation     Limestone equation     Table 7     Limestone equation	3835 ons Applied 5562  F AGRICULTUR. Hundredweigh ides I 0  To Manu 58415 322792 3542 19656 26534 8718 439657 Tons o Total 57046	on All  AL MATH t Appl insecti [189.] ns of re  State of Comm	Material Nitroge 292 1808 50 136 hill 136 ercial I Pri Ritrogen 10015 or appli	ND HIGH Croplan  Fur  16  8 in W  Fertilit mary N  P	972-73,  HWAY DE-ICING d Ingicides 63.5 fet Manure De Phosphorus 82 323 7 20 106 35 573 Izers Applied Butrients Phosphorus 69143 ms:	Total 3840.9 Fecated Potasi 222 1601 35 118 93 31 2113
Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure Nutrients  TABLE 5  Year  1964 1969 1972 Wet Manure	e Pactor: e Pactor: e Pactor: e Defecate in Wet Ma MANURE FRO	Tons per d: Tons, per d: Tons per d: Tons per d: Tons nure: Ny Pr Pr d: Tons nure: Ny Pr Pr d: Tons nure: Lbs. per d: Tons nure: trogen, t	r animal 1972 trogen, Tooshorus, translation of the trogen, Tooshorus, translation of the trogen, Tooshorus, translation of translation of the tra	Chic 4857 5664 414 414	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 351,2 50 7 35	8 Horr Poi	ses & nies  0 38 .78 .656 .6 .6 .8  Turkeys Raised  120000 .89,63 .8718 .336	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:  Herbic Table 1 3188.  Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3 Sheep: Table 4 Horses: Table 5 Turkeys: Table 5 Total from Livestock Tons Fertilizers:  Ltem Applied on Cropland: Table 7 Lime: Limestone equ	3835 ons Applied 5562  F AGRICULTUR. Hundredweigh ides I 0  To Manu 58415 322792 3542 19656 26534 8718 439657 Tons o Total 57046	on All  AL MATH t Appl insecti [189.] ns of re  State of Comm	Material Nitroge 292 1808 50 136 hill 136 ercial I Pri Ritrogen 10015 or appli	ND HIGH Croplan  Fur  16  8 in W  Fertilit mary N  P	972-73,  HWAY DE-ICING d Ingicides 63.5 fet Manure De Phosphorus 82 323 7 20 106 35 573 Izers Applied Butrients Phosphorus 69143 ms:	Total 384049 Fecated Potash 222 1601 35 118 93 31 2113
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Tons, 1' Wet Manure Nutrients  TABLE 4  Year  1964 1969 1972 Wet Manure  Year  1964 1969 1972 Wet Manure	e Pactor: e Pactor: e Pactor: e Defecate in Wet Ma MANURE FRO	Tons per d: Tons, per d: Tons per d: Tons per d: Tons, per d: Tons, nure: Nf Pr d: Tons, nure: Nf Pr d: Tons, per d: Tons nure: trogen, trogen, trogen, trogen, tonsphorus	r animal 1972 trogen, Tooshorus, translation of the trogen, Tooshorus, translation of the trogen, Tooshorus, translation of translation of the tra	Cons	322792 1808 323 161h Sheep Lambs 4532 2922 2200 1.61 351,2 50 7 35	8 Horr Poi	ses & nies  0 38 .78 .656 .656 .8  Turkeys .Raised  120000 .89.63 .8718 .136 .35	1970-71 1971-72 1972-73 Total Estimated T As Computed  TABLE 10SUMMARY Of Chemicals:    Herbic Table 1 3188.     Manure: Kind of Livestock Swine: Table 2 Cattle: Table 3     Sheep: Table 4     Horses: Table 5     Turkeys: Table 5     Turkeys: Table 5     Total from Livestock Tons     Fertilizers:     Item     Applied on Cropland: Table 7     Lime: Limestone equation     Limestone equation     Table 7     Limestone equation	3835 ons Applied 5562  F AGRICULTUR. Hundredweigh ides I 0  To Manu 58415 322792 3542 19656 26534 8718 439657 Tons o Total 57046	on All  AL MATH t Appl insecti [189.] ns of re  State of Comm	Material Nitroge 292 1808 50 136 hill 136 ercial I Pri Ritrogen 10015 or appli	ND HIGH Croplan  Fur  16  8 in W  Fertilit mary N  P	972-73,  HWAY DE-ICING d Ingicides 63.5 fet Manure De Phosphorus 82 323 7 20 106 35 573 Izers Applied Butrients Phosphorus 69143 ms:	Total 3840.9 Fecated Fotas 222 1604 35 118 93 31 2113

Hectare (ha)

Kilograms (kg)

.4047

907.2

PLANNING AREA: Lake Erie 4.0 \_\_ STATE: Ohio PLANNING SUBAREA: Southwest 4.2 COUNTY: Hancock

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	71359	1962.3	15858	237.8		
Grains	5/16/10	123.2	8213	82.1		
Hay or Grass Silage	3480	34.8	2900	29.0		
Pastured Cropland	2456	24.5	2456	24.5		
Other Field Crops	88240	1764.8	5515	24.5 55.1		
Vegetables	1137	36.4	1137	54.1	1137	64.6
Orchards			1			
Berries	50	2.4	57	10.4	58	14.4
Nursery, Greenhouse		100	-			
Other Crops						
Totals	191362	3948.4	36136	1493.0	1195	79.0
Total Herbicides, In	secticide	s, Fungio			228693	

## TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	51899	5735	5312	11047
1969	42418	4275	1117	8422
1972	14000	4291	Liblis	8736

	Number Cattle	and Calves
Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves
231.02	6098	17004
18124	4623	13501
19200	5103	14097
	13.14	6.45
	67053	90926
n Wet Manure: Nitrog	gen, tons 885	
	23102 1812L 19200 Factor: Tons 1 Defecated: 2 Defecated: Tons, 1977 n Wet Manure: Nitros	Total Cows & Heifers Calved  23102 6098 18124 4623 19200 5103  Factor: Tons 1 13.14  Defecated: 2 67053  Defecated: Tons, 1972 Combined: 157979 n Wet Manure: Nitrogen, tons 885

## TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	22974	40
1969 1972	20028 16300	534 1544
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, Tons	26243	19732 136
Phosphorus, Tons	55	136 20
Potash, Tons	262	118

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	198515		
1969	211731		
1972	239256	1500	15000
Wet Manure Factor: Lbs. per bird	82.9	365	89.63
reduting Deterored, Tone 1070	9917		
Nitrogen, tons	155		946 15
Phosphorus, tons	40		1
Potash, tons	35		3

TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	340352	Number I-V farms	1374
Number of farms	1818	Acres in I-V farms	301197
Acres in farms	322351	Cropland I-V farms	262937
Cropland in farms	278393	Harvested cropland	
Harvested cropland in farms	22h16h	I-V farms	214694

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	70173	11323	2755	71,078
GRAINS	40722	5349	269	5618
Wheat	30208	4237	222	11159
Oats	10061	1074	147	1121
Barley	120	6	0	6
Rye	285 93250	28	0	28
OTHER FIELD CROPS	93250	3457	Soft	3661
Soybeans	89887	2327	84	21,77
Potatoes	182	347	0	3117
Sugar beets				
Field beans	11/1/8	7	0	7
HAY OR GRASS SILAGE	10108	21/3	15	158
PASTURED CROPLAND	9439	69	0	69
Cropland used for pasture		52	0	52
Improved pasture	8396 1043	17	0	17
VEGETABLES, SWEET CORN, MELONS	1292	511	95	606
ORCHARDS	68	5	1	6
BERRIES	2	0	0	0
NURSERY & GREENHOUSE PRODUCTS	61	0	55	55
OTHER CROPS	32	0	0	0
Total Fertilizer Used, Tons		20864	3394	21,258
Percent of Fertilizer Used		86	11/1	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

(July 1, 1972-June 30, 1973)			APPLIED			
Item	Tons		Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	22754	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	8532	1972			13019	
Total	31.286		Tonnages for Other Recent Years			
Primary Nutrients in Fertilizer	15932	1971		THE COLD THE	h11.03	
Nitrogen	5061	1973			19288	
Phosphorus	4851					
Potash	6020					

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2150	
Total Estimat	ced Tons Applied on All Hi	ghways in 1972-73,

Hen	bicides	Ins	secticides	Fungicides	Total
Table 1   391	18.4		193.0	79.0	4520.4
Manure: Kind of		Tons	of Materials	in Wet Manure 1	Defecated
Livestock		Manure	Nitroger	Phosphorus	Potash
Swine: Table 2	-6	5083	325	91	247
Cattle: Table 3		57979	885	158 55	790
Sheep: Table 4	20	5243	367	55	262
Horses: Table 4		9732	136	20	118
Chickens: Table	5 9	917	155	40	35
Turkeys: Table 5	91	16	15	lt	3
Total from Livest	ock,	79900	1883	368	1455
Fertilizers:		Cons of		rtilizers Applie	d
		-		mary Nutrients	1 7
Item		Total	Nitrogen	Phosphorus	Potash
Applied on Cropla Table 7	and:	1286	5061	4851	6020

Lime: Limestone equivalent purchased or applied, tons:

Salts: Applied on all highways, tons: Table 9 3118

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Ohio
PLANNING SUBAREA: Southwest 4.2 COUNTY: Henry

TABLE 1 VETTMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1977

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	71155	1965.0	15879	238.1		
Grains	19699	98.4	15879 6567	65.6		
Hay or Grass Silage	2640	26.4	2200	22.0		
Pastured Cropland	1265	12.6	1265	12.6		
Other Field Crops	64480	1289.6	4030	40.3		
Vegetables	3402	108.8	3402	161.9	3402	193.3
Orchards						-
Berries	18	1.1	20	3.3	20	4.3
Nursery, Greenhouse						
Other Crops						
Totals Total Herbicides, In	162959	3501.9		543.8 00 lbs	3422 199744	197.6

	Hog & Pig	Number Son	vs Farrowing	
ear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	20592	1958	1803	3761
969	23026	1621	1,660	3281
972	2/1900	1739	1809	3548

Phosphorus, tons Potash, tons

100

TARTE 2 MANITOF FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	19474	14261	15213		
1969	13744	3686	10058		
1972	11/1/00	5481	8919		
Wet Manure I Per Animal	actor: Tons	13.14	6.45		
Wet Manure I Tons, 1972		72020	57528		
	Defecated: Tons, 19	rogen, tons 72	95) <sub>1</sub> 8 5		
		sphorus, tons 13			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	3615	
1969	1:1,03	1/12
1972	21,00	1001
Wet Manure Factor: Tons per anima	1 1.61	12.78
Wet Manure Defecated: Tons, 1972	3864	12793
Nutrients in Wet Manure: Nitroger	, Tons 54	88
	rus, Tons 8	13
Potash,	Tons 39	77

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		469995		
1969		513142		
1972		579850	1600	16000
Wet Manure Fa	ctor: Lbs. per bird	82.9	365	89.63
Wet Manure De	fecated: Tons, 1972	24035		
Nutrients in 1	Nitrogen, tons	375	Combined	1009
	Phosphorus, tons Potash, tons	96 8h		li li

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	s (1) 265920	Number I-V farms 1313
Number of farms	1695	Acres in I-V farms 252431
Acres in farms	266064	Cropland I-V farms 227759
Cropland in farms	238297	Harvested cropland
Harvested cropland in f	arms 200319	I-V farms 192903

	Crop	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	Tota
CORN	65555	10058	3283	13341
GRAINS	34815	1459	271	4730
Wheat	25312	3537	251	3788
Oats	9314	910	20	930
Barley	11	1	0	1
Rye	71.8	11	0	11
OTHER FIELD CROPS	80795	2811	352	3193
Soybeans	74748	1549	76	1625
Potatoes	57	36	0	36
Sugar beets				1000
Field beans	71:1	1	0	1
HAY OR GRASS SILAGE	81,66	185	5	190
PASTURED CROPLAND	5069	38	0	38
Cropland used for pasture	4734	37	0	37
Improved pasture	335	1	0	1
VEGETABLES, SWEET CORN, MELONS	3866	1198	116	1314
ORCHARDS	18	2	0	2
BERRIES	5	1	0	1
NURSERY & GREENHOUSE PRODUCTS	6	3	0	3
OTHER CROPS	105	6	0	6
Total Fertilizer Used, Tons		18792	4027	22819
Percent of Fertilizer Used		82	18	100

TABLE 7-FERTILIZER USED IN 1972

(July 1, 1972-June 30, 1973)

Item Tons

Fertilizer Used on Crops: Solid 26742

Liquid 10951

Total 37693

Primary Nutrients in Rertilizer 18754

Nitrogen 6546

Phosphorus 5592

TABLE 8--GROUND LIMESTONE EQUIVALENT
APPLIED

Tonnage
Government
Year Cost/Shared Cost/Shared Tonnage
1972
Tonnages for Other Recent Years
1971
1973
1710

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Tons Purchased Tons Applied Per
Year Through State "E" Mile

1970-71 1971-72 1972-73 3500 Total Estimated Tons Applied on All Highways in 1972-73, As Computed 5076

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	lerbicides		cticides	Fungicides	Total
Table 1 3	501.9	543.8		197.6	4243.3
Manure: Kind o	of	Tons	of Materials	in Wet Manure D	efecated
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2	2.5	26433	132	37	100
Cattle: Table	3	1295148	725	130	648
Sheep: Table		386h	54	8	39
Horses: Table		12793	88	13	77
Chickens: Tab		24035	375	96	84
Turkeys: Table		1009	16	- 4	14
Total from Live Tons	estock,	197682	1390	288	952
Fertilizers:		Tons of C	Commercial Fer	rtilizers Applie	d
TO LO LE LE DO LO 1			Prim	ary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potas
Applied on Cro	pland: 3	7693	6516	5592	6616

Table 7 3/093 0540 5572

Lime: Limestone equivalent purchased or applied, tons:
Table 8 903

Salts: Applied on all highways, tons: Table 9 5076

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compound
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PLANNING AREA: Lake Erie 4.0 STATE: Ohio PLANNING SUBAREA: Southwest 4.2 COUNTY: Huron

TABLE 1 PETIMATED AMOUNTS OF CHEMICALS HIGH ON CROPS 1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	50085	1377.3	11130	166.9		
Grains	19761	98.8	6587	65.8		
Hay or Grass Silage	4050	40.5	3375	33.7		
Pastured Cropland	2688	26.8	2688	26.8		
Other Field Crops	61920	1238.4	3870	38.7		
Vegetables	3044	97.4	30/4/4	244.9	3014	173.0
Orchards						-
Berries	239	12.1	271	49.0	280	67.5
Nursery, Greenhouse						
Other Crops						
Totals	141787	2891.3	30965	525.8	3324	2h0.5
Total Herbicides, In	secticide	s, Fungio	ides: 10	0 lbs	176076	3657.6

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	21569	21/11	1878	1019
1969	25242	2029	27.24	4153
1972	27600	2225	2316	4541

Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons 129

A ACIA	URE FROM CATTLE	Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964 1969 1972	19825 15216 16600	7744 5989 8127	12081 9227 8h73
Wet Manure F Per Animal	actor: Tons	13.14	6,45
Wet Manure D Tons, 1972		106789	54651
Wet Manure I Nutrients in	efecated: Tons, 1972 Wet Manure: Nitroge Phospho Potash,	n, tons	161hh0 90h 161 807

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	and the same of	Sheep & Lambs	Horses & Ponies
1964		17077	
1969		16114	727
1972		12300	1616
Wet Manure Factor: Tons per	animal	1.61	12.78
wet Manure Defecated: Tons.	1972	19803	20652
Nutrients in Wet Manure: Ni	trogen, Tons	277	2/13
	osphorus, Tons	42	21
Po	tash, Tons	198	124

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		106185		
1969		59474		
1972		67206	5000	50000
Wet Manure Fact	or: Lbs. per bird	82.9	365	89.63
THE CHILITIES DOTO	cotods Tone 1070	2786		
Nutrients in We	t Manure:		Combined	3153
	Nitrogen, tons	143		49
	Phosphorus, tons	11	_	13
	Potash, tons	10		11

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	318016	Number I-V farms	996
Number of farms	1557	Acres in I-V farms	241378
Acres in farms	278241	Cropland I-V farms	188569
Cropland in farms	212616	Harvested cropland	
Harvested cropland in fa	rms 158727	I-V farms	146087

	Crop	Tons o	f Fertilize	er Used
Crops	Acres	Dry	Liquid	Tota
CORN	142026	8606	1059	9665
GRAINS	31275	14432		4514
Wheat	19903	3004	82 50	3054
Oats	10124	1290	31	1321
Barley	156	21	0	21
Rye	52:5	54	1	55
OTHER FIELD CROPS	58782	1920	88	2008
Soybeans	57742	1533	70	1603
Potatoes	406	241	0	211
Sugar beets				
Field beans	1212	1	0.	12
HAY OR GRASS SILAGE	10829	192	5	197
PASTURED CROPLAND	10506	114	0	171
Cropland used for pasture	8504	96	0	96
Improved pasture	2002	18	0	18
VEGETABLES, SWEET CORN, MELONS	3459	1038	288	1326
ORCHARDS	374	46	0	146
BERRIES	31h 19	1	11,	15
NURSERY & GREENHOUSE PRODUCTS	0	0	0	0
OTHER CROPS	175	14	0	14
Total Fertilizer Used, Tons		16354	1536	1.7890
Percent of Fertilizer Used	1	91	9	100

TABLE 7--FERTILIZER USED IN 1972

(July 1, 1972-June 10, 1973)

Item Tons Tonnage Tonnage not Fertilizer Used on Crops: Solid Liquid Total Primary Nutrients in

Fertilizer Nitrogen Phosphorus Potash

Tonnage not Tonnage Year Cost/Shared Cost/Shared Tonnage | 1972 | 12739 | | 12739 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1973 | | 1 12739

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	3043	
Total Estima As Compute	ted Tons Applied on All Hi	ghways in 1972-73,

	Herbicides	Inse	cticides	Fungicides	Total	
Table 1	2891.3	52	5.8	2110.5	3657.6	
Manure: Kin-	d of	Tons	of Materials	in Wet Manure De	fecated	
Livestock		Manure	Nitrogen	Phosphorus	Potash	
Swine: Table	e 2	33830	169	47	129	
Cattle: Tab		1611/40	904	161	807	
Sheep: Table		19803	277	142	198	
Horses: Tab		20652	11/13	21	124	
Chickens: Table 5		2786	43	11	10	
Turkeys: Tal	ble 5	3153	49	13	11	
Total from Livestock, Tons		241664	1585	295	1279	
Fertilizers:		Tons of C	ommercial Fert	ilizers Applied		
			Primar	ry Nutrients		
Item		Total	Nitrogen	Phosphorus	Potash	
Applied on C	ropland:	24950	4170	3728	14594	

Salts: Applied on all highways, tons: Table 9 hhll

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
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PLANNING AREA:\_ Lake Erie 4.0 STATE: Ohio PLANNING SUBAREA: Southwest 4.2 COUNTY: Lucas

TARLE	1-ESTIMATED	AMOUNTS	OF	CHEMICATS	HC UT	ON	CRAPC	1072

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Grops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	29097	800.1	6466	96.9		
Grains	5428	27.1	1809	18.0		
Hay or Grass Silage	990	9.9	825	8.2		
Pastured Cropland	1,32	4.3	432	4.3		
Other Field Crops	26640	532.8	1665	16.6		
Vegetables	3120	99.8	3120	148.5	3120	177.3
Orchards						-
Berries	339	17.0	388	70.4	399	97.1
Nursery, Greenhouse						
Other Crops						
Totals	66046	1491.0	14705	362.9	3519	27h.h
Total Herbicides, In	secticide	s, Fungic	ides: 10	0 1bs	81,270	2128.3

## TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sows Farrowing		
	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	10551	947	951	1898
1969	10470	959	962	1921
1972	10800	971	1011	1982

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

#### TABLE 3--MANURE FROM CATTLE

		Number Cattle	Cattle and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	3947 3968	649	3298		
1969	3968	199	3469		
1972	14300	1890	21/10		
Wet Manure Per Anima	Factor: Tons	13.14	6.45		
Wet Manure Defecated: Tons, 1972		24835	15545		
	Defecated: Tons, 1972 n Wet Manure: Nitroge Phospho Potash,	n, tons 226			

## TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	792	
1969		250
1972	421	250 1620
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	6hh	20704
Nutrients in Wet Manure: Nitrogen, Tons	9	243
Phosphorus, Tons	1	21
Potash, Tons	6	124

#### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Chickens	Turkey Hens	Turkeys Raised
79036		
113068		
127767	6000	7500
82.9	365	89.63
5196		
83	Combined	1431
21		6
	79036 113068 127767 82.9 5196 83	Chickens Hens 79036 113068 127767 6000 82.9 5196 Combined 83

## TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 210776	Number I-V farms 505
Number of farms	785	Acres in I-V farms 86670
Acres in farms	98521	Cropland I-V farms 79858
Cropland in farms	88640	Harvested cropland
Harvested cropland in fa	rms 74932	I-V farms 69208

	Crop	Tons o	of Fertilize	er Used
Crops	Acres	Dry	Liquid	Tota
CORN	21657	14354	1218	5572
GRAINS	9615	1330	15	1345
Wheat	7149	1054 265	12	1066
Oats	71h9 2320	265	3	268
Barley	0	0	0	0
Rye	124	11	0	117
OTHER FIELD CROPS	31580	2168	238	21:06
Soybeans	28319	1156	67	1223
Potatoes	647	348	0	31:8
Sugar beets		1000		
Field beans	5	0	0	0
HAY OR GRASS SILAGE	2819	16	0	16
PASTURED CROPLAND	31,60	24	0	24
Cropland used for pasture	1353	22	0	22
Improved pasture	107	2	0	2
VEGETABLES, SWEET CORN, MELONS	3545	1321	119	31/10
ORCHARDS	455	108	0	1.08
BERRIES	21	2	0	2
NURSERY & GREENHOUSE PRODUCTS	213	95	1	96
OTHER CROPS	66	0	0.	0
Total Fertilizer Used, Tons		9448	1591	11039
Percent of Fertilizer Used		86	14	100

TABLE /FERTILIZER	JSED IN 1972	TABLE		MESTONE EQUIV	ALENT	
Item	Tons		APPLIED	San and		
Fertilizer Used on Crops: Solid	11386	Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage	
Liquid	2091	1972			9970	
Total	13477			nages for Oth	er Recent Yea	rs
Primary Nutrients in Fertilizer	6672	1971		The state of the s	9635	
Nitrogen	2433	1973			7/1807	
Phosphorus	2019					
Potash	2220					

### TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	7075	
Total Estima As Comput	ted Tons Applied on All H	ighways in 1972-73,

## TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

The second secon	and the second s		Secretary of the second			
	rbicides	Insec	ticides	Fungicides	Total	
Table 1	1491.0	362.9		274.4	2128.3	
Manure: Kind of	f	Tons o	f Materials	in Wet Manure D	efecated	
Livestock		Manure	Nitrogen	Phosphorus	Potasi	
Swine: Table 2	1	1667	73	21	56	
Cattle: Table	3 4	0380	226	140	202	
Sheep: Table 4		di	9	1	6	
Horses: Table 4	21	0704	11/3	21	124	
Chickens: Table		296	83	21	19	
Turkeys: Table	5 1	431	22	6	5	
Total from Lives Tons	stock,	3122	556	110	1,12	

Fertilizers:	Tons of	Commercial Fer	tilizers Applie	d	
		Primary Nutrients			
Item	Total	Nitrogen	Phosphorus	Potash	
Applied on Cropland: Table 7	13477	2433	2019	2220	

Lime: Limestone equivalent purchased or applied, tons: Table 8

Salts: Applied on all highways, tons: Table 9 10262

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453

					arrest months of the
PLANNING ARE	A: Lake Erie	4.0	STATE:	Ohio	
PLANNING SUB	AREA: Southwest	4.2	COUNTY:_	Mercer	

TARLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	HISED	ON	CROPS	1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	68974	1896.7	15328	229.9		
Grains	25738	128.6	8579	85.7		
Hay or Grass Silage	7650	76.5	6375	63.7		
Pastured Cropland	4584	45.8	145814	45.8		
Other Field Crops	64160	1283.2	4010	40.1		
Vegetables	1134	36.3	1134	54.0	1134	64.4
Orchards						
Berries	40	2.2	45	8.0	1.7	10.8
Nursery, Greenhouse						-
Other Crops						
Totals	172280	3469.3	40055	527.2	1181	75.2
Total Herbicides, In	secticide					h071.7

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	82093	9182	8180	17362
1969	86341	8684	8333	17017
1972	91800	8866	9227	18093

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons 7.45 134793 674

TABLE 3-MANUER FROM CATTLE

tal 27	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
	3,0000	
	17037	18190
13	17229	18184
00	30996	9304
Tons	13.14	6.45
d:	407287	60011
	Tons d: d: Tons, 197	Tons 13.14

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	6568	
1969		603
1972	7132 6200	603 573
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	9982	7323
Nutrients in Wet Manure: Nitrogen, Tons	9982 140	51
Phosphorus, Tons	21	7
Potash, Tons	100	lili

TABLE S-WANTED TOOK OUT

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		662725		
1969		1016878		
1972		111/9072	123000	1230000
Wet Manure Faci	or: Lbs. per bird	82.9	365	89.63
wer manure Defe	cated: Tons 1972	1,7629	100	
Nutrients in We	et Manure:		Combined	77297
	Nitrogen, tons	743		1205
	Phosphorus, tons	191	_	309
	Potash, tons	167		271

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres(1)	2811260	Number I-V farms	1591
Number of farms	2029	Acres in I-V farms	271530
Acres in farms	292024	Cropland I-V farms	2361.71
Cropland in farms	251266	Harvested cropland	
Harvested cropland in farm	s 199318	I-V farms	189211

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	66059	9917	1902	17819
GRAINS	h1631	5071	235	5306
Wheat	20861	2803	194	2997
Oats	20291	2222	1/1	2263
Barley	111	7	0	7
Rye	293 56711	31 11/21/	0	31
OTHER FIELD CROPS	56711	17/3/7	282	1706
Soybeans	51217	1191	273	1464
Potatoes	323	200	0	200
Sugar beets				
Field beans	1759	11:	0	231
HAY OR GRASS SILAGE	23786	856	45	901
PASTURED CROPLAND	18323	369	-8	377
Cropland used for pasture	16823	332	8	3210
Improved pasture	1500	37		37
VEGETABLES, SWEET CORN, MELONS	1289	358	14	372
ORCHARDS	149	6	0	6
BERRIES	6	2	0	2
NURSERY & GREENHOUSE PRODUCTS	0	0	0	0
OTHER CROPS	163	15	11	16
Total Fertilizer Used, Tons		18022	2497	20519
Percent of Fertilizer Used		88	12	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

(July 1, 1972-June 30, 1973) Item Tons			APPLIED		
			Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	26364	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	8597	1972			2551:7
Total	34961		mages for Oth	ow Bosons Von	
Primary Nutrients in Fertilizer 17712		1971		er necent rea	29383
Nitrogen	4991	1973			TSSSOT
Phosphorus	6517				
Potash	620h				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile	
1970-71			
1971-72			
1972-73	2500		
Total Estim	ated Tons Applied on All Hig ted 3626	ghways in 1972-73,	

11001-01-01	nure Nitro	75.2 als in Wet Manure gen Phosphorus 189	Potash
Livestock Man Swine: Table 2 1347 Cattle: Table 3 4672 Sheep: Table 4 9982	nure Nitro	gen Phosphorus	Potash
Swine: Table 2       1347         Cattle: Table 3       4672         Sheep: Table 4       9982			200
Cattle: Table 3 4672 Sheep: Table 4 9982	98 2617		512
Sheep: Table 4 9982		7 467	2336
		21	100
HOTSESI INDIE 4	9 743	7	1/1
Chickens: Table 5 4762	9 743	191	167
Turkeys: Table 5 7729	7 1210	310	271
Total from Livestock, 7443	22 51435	1185	3430
Fertilizers: Tons		Fertilizers Appli	ed
		rimary Nutrients	
Item Total	Nitroge	n Phosphorus	Potash
Applied on Cropland: 34961	4991	6517	620h

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

# GREAT LAKES BASIN MATERIAL USAGE INVENTORY Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Ohio

TABLE 1ESTIMATED							TABLE 6-CROP		12372				
	Herbi	cides	Insec	ticides	Fungi	cides	COUNTY, land	area, ac	res (1) 167290	Nu Nu	mber I-V		
Crop Group		Amount	X	Amount	Acres	Amount	Number of far		979	Ac	res in I-		1089
or Crops	Acres Treated	100 lbs	Acres	William William	Treated	The second secon	Acres in farm		13027	Cr	opland I-		3/12
		-			- Leaved	200	Cropland in i			Ha	rvested o	-V farms 773	ioh
Corn Grains	10368	324.8	3456	38.1			Harvested cro	pprand in	Tarms 0/020		1.	Tarms 113	17/4
Hay or Grass Silage	3690	51.8	3075	30.7						Crop	Tons	s of Fertilize	er Used
Pastured Cropland	1478	4.7	478	4.7				Crops		Acres	Dry	Liquid	Tot
Other Field Crops	35840	716.8	2240	22.4			CORN			10923	1557	1176	203
Vegetables	1322	42.3	1322	62.9	1322	75.1	GRAINS			16075	1772	235	200
Orchards							Wheat			10862	1300	190	11:9
Berries	1060	49.9	1225	225.4	1256	314.5	Oats			4686	436	144	1,80
Mursery, Greenhouse							Barley			107	9	1	10
Other Crops		-	-				Rye			227	20	0	20
		-					OTHER FIELD	CROPS		36098	2052	681	273
							Soybeans			32294	1071	288	135
							Potatoes Sugar beets			1	1	0	1
otals	64206	1217.2	3h3h0	418.7	2578	389.6	Field beans			78	3	0	3
otal Herbicides, In	secticide	s, Fungi	cides: 1	00 1bs	811.24	2025.5	HAY OR GRASS			10382	188	10	198
							PASTURED CROS			1625	16	0	16
ABLE 2MANURE FROM	SWINE						Cropland us		asture	1471	11	0	77
Una C Di		Jumbar Sa	ws Farrow	ing			Improved pa			154	5	0	5
Hog & Pi		L-May 31		Nov. 30			VEGETABLES, S	SWEET COR	N, MELONS	2823	923	317	124
Year Dec. 1		ring	Fa		Total	al	ORCHARDS			1502	316	50	366
			1,63		988		BERRIES	amana and and and	paopriomo	9	1	0	1
1964 5913 1969 5613	3	27	510		105		NURSERY & GRI	ERNHOUSE	FRODUCTS	133	1 2	0	2
1969 5643 1972 5900	- 3	40 38	560		109		OTHER CROPS	lane Hack	Tone	133	6832	1769	860
					-		Percent of Fe				79	21	100
et Manure Factor:			arrowed	7.49			TELCORE OF I		0500		1.12		-
let Manure Defecate			200	41	1		TABLE 7-FER	PTI TOPP I	SED IN 1972	TARLE 8	CROUND LT	MESTONE EQUIV	ALENT
Nutrients in Wet Ma				11							APPLIED	Taloxona agen	
		osphorus, tash, ton		31			(July 1, 1972 Item		Tons	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	and the later of	Carrier of the Control	
	101	tasn, ton	8	24					1000		onnage	Tonnage not	Total
							Fertilizer U		0120		ernment	Government	Total
TABLE 3-MANURE FRO	M CATTLE	-					on Crops:		8138	Year Cos	t/Shared	Cost/Shared	Tonnag
							Total	Liquid	3510	1972			3009
					nd Calves		Primary Nutr	ients in	11000		s for Oth	er Recent Yea	
		0	lows & Hei			, Steers,	Fertilizer	LUNEO AND	5759	1971			3587
Year To	tal		Calve	d	Bulls	, Calves	Nitrogen		1383	1973			1837
1964 778			2269		5500	10 1	Phosphorus		2280				
1969 56			1876		3769		Potash		2096				
1972 620	00		2835		3365								
Wet Manure Factor:	Tons			19						Charles and Ca		Name of the latest of the late	DANCE AND CO.
Per Animal			13.14		6.45		TABLE 9SAL	TS APPLI	ED TO FEDERAL	, STATE, C	OUNTY, &	MUNICIPAL HI	GHWAY S
Wet Manure Defecate	dec								Tone Durches	ad l	Tone	Applied Per	
Tons, 1972	4.		37252		2170		Year		Tons Purchas Through Sta		Tons	'E" Mile	
	0 //25			#Bod.	,				Intough ben	-			
Wet Manure Defecate				5895	)		1970-71						
Nutrients in Wet Ma				330			1971-72		7070				
		osphorus tash, to		59 295			1972-73	F	5050 ons Applied o	411 174 ob	arana da '	1072-72	_
	- 50	reasil, col	15	-672				muted 1		n vir urgo	ways in .	17/2-13,	
							AS LOT	apureu	1242				
TABLE 4-MANURE FRO	M SHEEP A	ND HORSES	3		-								
				Charm	ti-	og I							
Vann	Item		TOTAL	Sheep & Lambs		es &	TABLE 10S	UMMARY OF	AGRICULTURA	MATERIAL	S AND HIG	HWAY DE-ICINO	
Year	1.0041				1011		-			W. 14 P.			
1964	1000			1659		20	Chemicals:		Hundredweight	Applied c	n Cropla	nd	
1969				2040	20	56		Herbic	ides In	secticides		ungicides	Tota
1972				800			Table 1	1217.2		418.7			2025.5
Wet Manure Factor:				1.61	12	2.78	Manure: Kin				rials in 1	Wet Manure De	fecated
Wet Manure Defecate	d: Tons,	1972		1288	10	0940	Livestock		Manur		rogen	Phosphorus	Pota
Nutrients in Wet Ma				18	70		Swine: Tab		8180	141		11	31
		osphorus		13	11		Cattle: Tab		58956	33	0	59	295
	Po	tash, Tor	18	13	- 60		Sheep: Tab		1288	33 18		3	13
M 4 M M M M M M M M M M M M M M M M M M							Horses: Tal	ole 4	1.0940	75		11	66
TABLE 5MANURE FRO	M CHICKEN	S & TURK	EYS				Chickens:		6593	10	3	26	23
					-		Turkeys: T						-
Vaav	Item		70.414		Turkey	Turkeys	Total from 1		CONTRACTOR OF THE PARTY OF THE	52	7	270	1.00
Year	rrem		Chicke	ens	Hens	Raised	Tons	3	85957	56	1	110	428
1964			122995				Fertilizers	1	Tons of	Commercia	al Fertil	izers Applied	
1969			140324								Primary	Nutrients	
1972			158566				Ite		Total	Nitro	gen	Phosphorus	Pota
Wet Manure Factor:	Lbs, per	bird	82.9				Applied on	Cropland:	11.668	3 303		2280	2096
			6573				Table 7		TTOHO	1383		2200	2090
Wet Manure Defecate			F-1-6-1		ombined						-		
Nutrients in Wet M	mure:			0.0	and Title C		Lime: Lime:	stone equ	ivalent purch	ased or a	oplied, t	ons:	
Nutrients in Wet M	trogen, t	ons	103	G.	Morned		Lime: Lime: Table		ivalent purch	ased or a	oplied, t	ons:	
Nutrients in Wet M		tons	103 26 23	- 0	Morned		Table	e 8					

To

Kilograms (kg) Hectare (ha) Kilograms (kg)

To Convert From

Pounds (1b) Acres (acre) Tons (ton) Multiply By

0.453 .4047 907.2 (1) County, land area, acres includes water areas under 40 acres in size.

252

COUNTY: Paulding

STATE: Ohio PLANNING AREA: Lake Erie 4.0 PLANNING SUBAREA: Southwest 4.2

	Herbi	cides	Insect	icides	Fungicides		
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	
Corn	52470	1442.9	11660	174.9			
Grains	25250	126.2	8417	84.1			
Hay or Grass Silage	1650	16.5	1375	13.7			
Pastured Cropland	1284	12.8	1284	12.8			
Other Field Crops	71040	1420.8	11/10	1411.4			
Vegetables	110	3.5	110	5.2	110	6.3	
Orchards					-		
Berries							
Nursery, Creenhouse							
Other Crops							
Totals	151804	3022.7	27286	335.1	110	6.3	

TABLE 2--MANURE FROM SWINE

Hog & Pig		Number Son		
	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	8049	917	786	1703
1969	6576	7214	613	1337
1972	6800	677	705	1382

Potash, tons\_

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	6867	2295	4572			
1969	4774	1795	2979 3021			
1972	5100	2079	3021			
Wet Manure Factor: Tons Per Animal		13.11	6.45			
Wet Manure Defecated: Tons, 1972		27318	19485			

TABLE 4-MANUER FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	3512	
1969	1813	275
1972	1300	71.7
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2093	9547
Nutrients in Wet Manure: Nitrogen, Tons	29	66
Phosphorus, Tons	1	10
Potash, Tons	21	57

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		39685		
1969		82510		
1972		93236	4000	17000
Wet Manure Fac	tor: Lbs. per bird	82.9	365	89.63
Wet Manure Def	ecated: Tons, 1972	3865		
Nutrients in W	et Manure:		Combined	1492
	Nitrogen, tons	60		7
	Phosphorus, tons	15		2
	Potash, tons	11/2		6

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres(1) 266880	Number I-V farms 775 Acres in I-V farms 2h23h2
Number of farms 1157 Acres in farms 263155	Cropland I-V farms 219611
Cropland in farms 235393 Harvested cropland in farms 190848	Harvested cropland I-V farms 181503

	Стор	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid		
CORN	43795	4770	2733	7503	
GRAINS	43800	4070	928	4998	
Wheat	18390	1996	533	2529	
Oats	25176	2055	395	2450	
Barley	4	0	0	0	
Rye	211	17	0	17	
OTHER FIELD CROPS	85166	884	Slile	1128	
Soybeans	84956	823	570	1063	
Potatoes	103	50	0	50	
Sugar beets					
Field beans	5486	6	2	8	
HAY OR GRASS SILAGE	630h	69	0	69	
PASTURED CROPLAND	14750	21	10	37	
Cropland used for pasture	4391	24	0	124	
Improved pasture	359	7	10	17	
VEGETABLES, SWEET CORN, MELONS	125	20	3	23	
ORCHARDS	0	0	0	0	
BERRIES	4	1	0	1	
NURSERY & GREENHOUSE PRODUCTS	0	0	0	0	
OTHER CROPS	10	1	0	1	
Total Fertilizer Used, Tons		9842	3920	13762	
Percent of Fertilizer Used		72	28	100	

TABLE 7-FERTILIZER USED IN 1972 (July 1, 1972-June 30, 1973)		TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENI
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	11283	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	4526	1972			7673
Total	15809	Tor	mages for Oth	er Recent Yea	rs
Primary Nutrients in Fertilizer	7925	1971			12357
Nitrogen	21/38	131717			
Phosphorus	2718				
Potash	2769				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	1250	1 1070 70
Total Estima	ted Tons Applied on All Hi	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide		secticides	Fungicides 6.3	Total 3364.1	
Table 1 3022.7			335.1			
Manure: Kind of Livestock		Tons of Materials in Wet Manure Defecated				
		Manure	Nitroga	en Phosphorus		
Swine: Tal		10296	161	11	36	
Cattle: T		1,6803	262	1.7	23/1	
Sheep: Tal		2093	29	1	21	
Horses: T		9547	66	3,0	57	
Chickens:	Table 5	3865	60	15	34	
Turkeys:	Table 5	11/92	23	- 6	5	
Total from	Livestock,	74096	601	123	367	
Fertilizer	0.1	Tons of	Commercial	Fertilizers Appli	ed	
LETETITION			Pr	imary Nutrients		
It	em	Total	Nitrogen	Phosphorus	Potast	
Applied on Table 7		15809	2438	2718	2769	

Salts: Applied on all highways, tons: Table 9 1813

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Ohio
PLANNING SUBAREA: Southwest 4.2 COUNTY: Putnam

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	60007	1650.1	13335	200.2		
Grains	23176	115.8	7725	77.2		
Hay or Grass Silage	3900	39.0	3250 2359	32.5		
Pastured Cropland	2359	23.5		23.5		
Other Field Crops	85600	1712.0	5350	53.5		
Vegetables	1,598	11:7.1	1598	218.9	4598	261.3
Orchards		- Color Division				
Berries						
Nursery, Greenhouse			7			
Other Crops						
		-200 4	A//22	***	1 don	0/7 2
Totals Total Herbicides, In		3687.5		605.8	14598 220855	261.3 4554.6

TABLE 2--MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	62280	6884	6334	13218
1969	57715	5514	5621	11165
1972	59700	5659	5890	11549

 Wet Manure Factor:
 Tons per litter farrowed
 7.45

 Wet Manure Defecated:
 Tons, 1972
 86040

 Nutrients in Wet Manure:
 Nitrogen, tons
 130

 Phosphorus, tons
 120

 Potash, tons
 327

TABLE 3-MANURE FROM CATTLE

		Number Cattle	Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964 1969	25535 20686	7618 6318	17887 11338				
1972	22200	8883	13317				
Wet Manure   Per Anima	actor: Tons	13.14	6.45				
Wet Manure Tons, 197		116723	85895				

TABLE 4--MANURE FROM SHEEP AND HORSES

Year	Item	Sheep & Lambs	Horses & Ponies
1964		8899	
1969		6713	285
1972		5600	823
Wet Manure Factor	: Tons per animal	1.61	12.78
Wet Manure Defeca	ited: Tons, 1972	9016	10518
Nutrients in Wet	Manure: Nitrogen, Tons	126	73
	Phosphorus, Tons	19	11
	Potash, Tons	90	63

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		563305		
1969		571304		
1972		645574	19600	316000
Wet Manure Factor:	Lbs. per bird	82.9	365	89.63
Wet Manure Defecate	d: Tons, 1972	26759		
Nutrients in Wet Ma	nure: trogen, tons	417		17739 277
Ph	osphorus, tons	107		71
Po	tash, tons	94		62

TABLE 6-CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	337010	Number I-V farms	1643
Number of farms	1975	Acres in I-V farms	290653
Acres in farms	306085	Cropland I-V farms	260018
Cropland in farms	272049	Harvested cropland	
Harvested cropland in farms	231113	I-V farms	222700

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	66365	9577	3249	12826
GRAINS	36736	14169	21/1	4720
Wheat	25899	3436	197	3633
Oats	10316	998	111	10/12
Barley	1111	5	0	15
Rye	188	16	0	16
OTHER FIELD CROPS	100516	1559	436	11995
Soybeans	92242		163	2/12/1
Potatoes	261	172	1	1.73
Sugar beets				
Field beans	2656	74	0	11/1
HAY OR GRASS SILAGE	13564	311	8	319
PASTURED CROPLAND	9531	78	1	79
Cropland used for pasture	8691	76	1	77
Improved pasture	840	2	0	2
VEGETABLES, SWEET CORN, MELONS	5225	1547	182	1729
ORCHARDS	4	0	0	0
BERRIES	6	2 -	0	2
NURSERY & GREENHOUSE PRODUCTS	1	0	0	0
OTHER CROPS	230	35	1	36
Total Fertilizer Used, Tons		20592	4118	24710
Percent of Fertilizer Used		83	17	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

(July 1, 1972-June 30	. 1973)	-	APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	26842	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	7268	1972			16737
Total	31,110	Tonnages for Other Recent Years			
Primary Nutrients in Fertilizer	17168	1971			2712h 30200
Nitrogen	5279	17/2			1 2000
Phosphorus	5823				
Potash	6066				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HICHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	1990	
Total Estima As Comput	ted Tons Applied on All Hi ed 2886	ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-IGING

W 5 5 5 5	Herbicides		cticides	Fungicides 261.3	Total
Table 1	3687.5				
Manure: K	ind of	Tons	of Materials	in Wet Manure I	
Livesto	ck	Manure	Nitrogen	Phosphorus	Potash
Swine: Ta		86040	430	120	327
Cattle: T		202618	1135	203	1013
Sheep: Ta		9016	126	19	90
Horses: T		10518	73	11	63
Chickens:		26759	417	107	94
Turkeys:		17739	277	71	62
	Livestock,	352690	2458	531	1649
Fertilizer	s:	Tons of C	commercial Fer	tilizers Applie	d
			Prima	ry Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potas
Applied on Table 7	Cropland:	34110	5279	5823	6066

Lime: Limestone equivalent purchased or applied, tons:
Table 8 16737

Salts: Applied on all highways, tons: Table 9 2886

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

PLANNING AREA: Lake Erie 4.0 STATE: Ohio

PLANNING SUBAREA: Southwest 4.2

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	CONTRACTOR OF THE PARTY OF THE	Amount Used 100 lbs		Amount Used 100 lbs
Corn	47700	1311.7	10600	159.0		
Grains	14089	70.4	4696	46.9		
Hay or Grass Silage	3390	33.9	2825	28.2		
Pastured Cropland	1735	17.3	1735	17.3		
Other Field Crops	50160	1003.2	31.35	31.3		
Vegetables	6370	203.8	6370	303.2	6370	362.0
Orchards						
Berries	966	47.4	1107	201.9	1138	279.7
Nursery, Greenhouse Other Crops						
Totals	12hli10	2687.7	30468	787.8	7508	61.7

TARIR	2-MANT	RE FROM	SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	20572	2046	1903	3949
1969	21959	1486	1542	3028
1972	21/100	1628	1695	3323

Wet Manure Factor: Tons	per litter farrowed	7.45
Wet Manure Defecated: Ton		21,756.
Nutrients in Wet Manure:		124
THE RESIDENCE OF THE PARTY OF T	Phosphorus, tons	35
	Potash, tons	911

TABLE	3-MANURE	FROM	CATTLE

		Number Cattle	Number Cattle and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	23395	7486 5862	15909		
1969	18801		12939		
1972	20000	8127	11873		
Wet Manure Per Anima	Factor: Tons	13.14	6.45		
Wet Manure Tons, 197		106789	76581		
			70		

## TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	6690	
1969	6465	655 1686
1972	6600	
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	10626	21547
Nutrients in Wet Manure: Nitrogen, Tons	148	7/19
Phosphorus, Tons	22 106	22
Potash, Tons	106	129

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	142075		
1969	137632 15552h		
1972	155524		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	6446		
Nutrients in Wet Manure: Nitrogen, tons	101	Combined	11.115
Phosphorus, tons	26	_	
Potash, tons	23		-

# COUNTY: Sandusky TABLE 6 CODE ACRES 6 FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	261888	Number I-V farms 1058
Number of farms	1/188	Acres in I-V farms 222494
Acres in farms	21,0921	Cropland I-V farms 19h3h2
Cropland in farms	208239	Harvested cropland
Harvested cropland in farms	160598	I-V farms 151976

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	1458214	8592	1562	10154
GRAINS	26811	3771	62	3833
Wheat	19017	281/1	53	2891
Oats	7102	888	7	895
Barley	125	19	0	
Rye	285	1.7	1	1.8
OTHER FIELD CROPS	58922	5504	264	5768
Soybeans	50689	2451	78	2529
Potatoes	357	219	0	219
Sugar beets				
Field beans	118	0	0	0
HAY OR GRASS SILAGE	11705	326	0	330
PASTURED CROPLAND	7690	1.00		100
Cropland used for pasture	6179	84	0	84
Improved pasture	1511	16	0	16
VEGETABLES, SWEET CORN, MELONS	7239	2915	150	3065
ORCHARDS	1319	255	0	255
BERRIES	143	8	0	8
NURSERY & GREENHOUSE PRODUCTS	96	1	0	
OTHER CROPS	22	13	0	3
Total Fertilizer Used, Tons		21/175	20/12	23517
Percent of Fertilizer Used		91	4	100

## TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

(July 1, 1972-June 30, 1973)		TABLE	APPLIED					
Item	Tons		Tonnage	Tonnage not				
Fertilizer Used on Crops: Solid	30427	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage			
Liquid	3762	1972			4897			
Total	31,189	Tor	nages for Oth	er Recent Yea	rs			
Primary Nutrients in Fertilizer	17602	1971	The state of the s		5541 7019			
Nitrogen	5375	1213						
Phosphorus	5232							
The state of the s	FOOT							

TABLE 9-- SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1072 72	4700	
Total Estima As Comput	ted Tons Applied on All Hig	ghways in 1972-73,

#### TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide 2687.7		ecticides 87.8	Fungicides 501.7	Total		
Table 1					Defendad		
Manure: K				s in Wet Manure			
Livesto		Manure			94		
Swine: Tal	ble 2	24756	124	35			
Cattle: T	able 3	183370	1027	183	917		
Sheep: Ta		10626	148	22	106		
Horses: T	able 4	21547	149	22	129		
Chickens:	Table 5	Guli6	101	26	23		
Turkeys:	Table 5						
Total from To	Livestock,	246745	1549	288	1269		
Fertilizer	e:	Tons of	Commercial 1	Fertilizers Appli	ed		
LEICITION			Pri	Imary Nutrients			
Te	em	Total	Nitrogen	Phosphorus	Potasi		
	Cropland:	34189	5375	5232	6995		
Lime: Lim	estone equiv	alent purcha	ased or appli	led, tons:			

To Convert From

Pounds (1b) Acres (acre) Tons (ton) Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
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PLANNING AREA: Lake Erie 4.0 STATE: Ohio Southwest 4.2 COUNTY: Seneca PLANNING SUBAREA:

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	65635	1804.9	14586	218.7		
Grains	25006	125.0	8335	83.3		
Hay or Grass Silage	5160	51.6	4300	43.0		
Pastured Cropland	3292	32.9	3292	32.9		B. L
Other Field Crops	74000	1480.0	4625	46.2		
Vegetables	11190	17.7	1490	70.9	11190	84.7
Orchards						
Berries	27	2.1	27	4.2	29	4.9
Nursery, Greenhouse						
Other Crops						
Totals	174610	35141.2	36655	1499.2	1519	89.6
Total Herbicides, In				0 lbs	212784	4133.0

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	42685	14150	3913	8333
1969	38714	3747	3647	7394
1972	40800	3815	3971	7786

per litter farrowed	7.45
ns, 1972	58006
Nitrogen, tons	290
Phosphorus, tons	81.
Potash, tons	220

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves
1964	26609	9623	16986
1969	19352 20800	7587 10773	11.765
1972	20800	10773	10027
Wet Manure   Per Animal	Factor: Tons	13.14	6.45
Wet Manure I Tons, 1972	Secretary and se	11:1557	64674
	Defecated: Tons, 1972 Wet Manure: Nitroge		06231 155
			06
	Potesh		027

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	26461	1200
1969	22911	680
1972	19600	1563
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	31556	19975
Nutrients in Wet Manure: Nitrogen, Tons	31556 441	138
Phosphorus, Tons	66	20
Potash, Tons	316	120

## TABLE 5-MANIRE FROM CUTCYENS & THEFFE

Year	Item	Chickens	Turkey	Turkeys Raised
1964		138505		
1969		1,06832		
1972		120720	5000	50000
Wet Manure Fac	tor: Lbs. per bird	82.9	365	89.63
Wet Manure Defe	ecated: Tons, 1972	5004		37.00
Nutrients in W	Nitrogen, tons	78	Combined	3142
	Phosphorus, tons	20		13
	Potash, tons	18		11

## TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 352660	Number I-V farms 1370
Number of farms	1887	Acres in I-V farms 300893
Acres in farms	329755	Cropland I-V farms 250438
Cropland in farms	271501	Harvested cropland
Harvested cropland in far		I-V farms 194604

	Crop	Tons o	f Fertilize	er Used
Crops	Acres	Dry	Liquid	Tota
CORN	58113	9784	2131	71975
GRAINS	41340	5789	106	5895
Wheat	28431	4262	79	4342
Oats	11439	1387	27	1414
Barley	151	11	0	11
Rye	1014	126	1	127
OTHER FIELD CROPS	78688	3159	364	3523
Soybeans	760L8	2285	187	21472
Potatoes	179	94	7	101
Sugar beets		10000		
Field beans	1465	6	0	6
HAY OR GRASS SILAGE	15231	391	26	1417
PASTURED CROPLAND	13198	202	6	208
Cropland used for pasture	11739	192	6	198
Improved pasture	1459	10	0	10
VEGETABLES, SWEET CORN, MELONS	1693	500	127	627
ORCHARDS	16	0	0	0
BERRIES	16	5	0	5
NURSERY & GREENHOUSE PRODUCTS		0	1 0	1
OTHER CROPS	97	0	0	0
Total Fertilizer Used, Tons		19836	2761	22597
Percent of Fertilizer Used	BOT ENDI	88	12	100

(July 1, 1972-June 3		TABLE	APPLIED	MESTONE EQUIV	ALENT
Item Fertilizer Used on Crops: Solid	Tons 6910	Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
Liquid Total Primary Nutrients in	8813 15723		nages for Oth	er Recent Yes	
Fertilizer Nitrogen	15723 4810 5132	1971			56442 47295
Phosphorus Potash	5781				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	3750	
Total Estima	ted Tons Applied on All I	lighways in 1972-73,

## TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

3544.2	1,00		Fungicides	Total
	422	7.2	89.6	4133.0
of	Tons o	f Materials	in Wet Manure D	efecated
	Manure	Nitrogen	Phosphorus	Potash
2	58006	290	81	220
3	206231	1155	206	1031
4	31556	1443	66	316
4	19975	138	20	120
le 5	5004	78	20	18
e 5	3142	49	13	11
estock,	323914	2151	406	1716
	2 2 3 4 2 4 3 1e 5 1e 5 vestock,	Manure 58006 2 3 206231 4 31556 2 4 19975 5001 16 5 5001 16 5 311/2 vestock,	Manure Nitrogen 2 58006 290 2 3 206231 1155 4 31556 441 2 4 19975 138 316 5 5004 78 4 19975 49 3142 49	Manure

Fertilizers:	Tons of	Commercial Fer	tilizers Applied	1
		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	15723	4810	5132	5781

Lime: Limestone equivalent purchased or applied, tons: Table 8 28094

Salts: Applied on all highways, tons: Table 9 5439

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

PLANNING AREA: Lake Eric 4.0 STATE: Ohio
PLANNING SUBAREA: Southwest 4.2 COUNTY: VanWert

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS.	1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used
Corn	68593	1886.2	15243	228.6		
Grains	20981	104.9	699h 1450	69.9		
Hay or Grass Silage	1740	17.4	1450	69.9		
Pastured Cropland	1227	12.2	1227	12.2		
Other Field Crops	85600	1712.0	5350	53.5		
Vegetables	319	10.2	319	15.2	319	18.1
Orchards	3127					
Berries	22	1.0	25	4.6	26	6.5
Nursery, Greenhouse						
Other Crops						
Totals	178/182	371,3.9	30608	398.5	31.5	24.6
Totals Total Herbicides, In	178482 secticide	3743.9 s, Fungio	30608 cides: 10	398.5 0 1bs	345 209435	h

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	19125	1979	1877	3856
1969	16416	1637	1600	3237
1972	16900	1.632	1700	3332

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	10099	3232	6867		
1969	7203	2274	4929		
1972	7300	3024	4276		
Wet Manure I Per Animal	Pactor: Tons	13.14	6.45		
Wet Manure I Tons, 1972		39735	27580		
			5		

## TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1,700	
1969	3076	1488
1972	2/100	1.035
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	3864	13227
Nutrients in Wet Manure: Nitrogen, Tons	511	91
Phosphorus, Tons	8	1.3
Potash, Tons	39	79

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	148315		
1969	137627		
1972	155519	2000	20000
Wet Manure Factor: Lbs. per bird	82.9	365	89.63
wet Manure Defecated: Tons, 1972	61116		
Nutrients in Wet Manure:		Combined :	1261
Nitrogen, tons	101	1	20
Phosphorus, tons	26	1	5
Potash, tons	23		1

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 261760	Number I-V farms 1103	
Number of farms	1378	Acres in I-V farms 245930	
Acres in farms	258417	Cropland I-V farms 223476	
Cropland in farms	233512	Harvested cropland	
Harvested cropland in f	arms 203797	I-V farms 196753	

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	63307	7967	3511	111/78
GRAINS	38645	1,81,6	1439	5285
Wheat	22569	3183	385	3568
Oats	15750	1628	52	1680
Barley	1 5	1	0	1
Rye	321 88031	35	2	37
OTHER FIELD CROPS	88031	1317	220	1537
Soybeans	86528	1080	159	1239
Potatoes	2	0	0	0
Sugar beets		9		
Field beans	2185	24	1	25 58
HAY OR GRASS SILAGE	6246	53	5	58
PASTURED CROPLAND	4946	40	2	42
Cropland used for pasture	4652	36	2	38
Improved pasture	294	4	0	4
VEGETABLES, SWEET CORN, MELONS	362	141	12	153
ORCHARDS	31	2	0	2
BERRIES	0	0	0	0
NURSERY & GREENHOUSE PRODUCTS	27	0	0	0
OTHER CROPS	17	2 .	0	2
Total Fertilizer Used, Tons		14392	4190	18582
Percent of Fertilizer Used	Marie Ton	77	23	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT (July 1, 1972-June 35, 1973)

(July 1, 1972-June 3)	), 1973)	TABLE	APPLIED	IMDIONO DQUET	
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	17636	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	16148	1972			6556
Total	33784		nagge for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	15945	1971	nages IOI oth	or moteric rea	23/47
Nitrogen	5746	1973			38050
Phosphorus	5068				
Potash	5131				

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	1710	
Total Esti	imated Tons Applied on All Hi outed 2480	ghways in 1972-73,

## TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbicid			ecticides	Fungicides	Total
Table 1	3743.9	398.5		24.6	4167.0
Manure: Kind of		Tons	of Material	s in Wet Manure	
Livesto	·k	Manure	Nitrogen	n Phosphorus	Potash
Swine: Table 2		21,823	124	35 67	94
Cattle: Table 3		67315	377		337
Sheep: Table 4		3864	514	8	39
Horses: Ta		13227	91	13	79
Chickens:		6446	101	26	23
Turkeys: 1		1261	20	5	14
Total from Tor	Livestock,	116936	767	154	576
Fertilizers	11	Tons of		ertilizers Appli	ed
				mary Nutrients	
Ite	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	33784	5746	5068	5131

Lime: Limestone equivalent purchased or applied, tons:
Table 8 6556

Salts: Applied on all highways, tons: Table 9 2480

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING	AREA:	Lake Erie	4.0	STATE:	Ohio
PLANNING	SUBAREA:	Southwest	4.2	COUNTY:	Williams

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	146078	1267.1	102/10	153.5		
Grains	16285	81.4	5428	54.2		
Hay or Grass Silage	3570	35.7	2975	29.7		
Pastured Cropland	2415	24.1	2415	24.1		
Other Field Crops	52880	1057.6	3305	33.0		
Vegetables	257	8.2	257	12.2	257	14.6
Orchards				30.00	~/!	
Berries						
Nursery, Greenhouse		770				
Other Crops						
Totals	121485	2474.1	21,620	306.7	257	14.6
Total Herbicides, In	secticide	s. Fungic	idee: 10	0 lbe	146362	2795.4

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1		June 1-Nov. 30 Fall	Total
964	35712	3633	3413	7046
1969	35093	3041	2799	581,0
1972	37100	3025	31/19	61.74

 Wet Manure Factor: Tons per litter farrowed
 7.45

 Wet Manure Defecated: Tons, 1972
 45996

 Nutrients in Wet Manure: Nitrogen, tons
 230

 Phosphorus, tons
 64

 Potash, tons
 175

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964 1969 1972	28964 25399 28000	8476 6114	20488 19255			
	actor: Tons	13.14	19495			
Wet Manure Defecated: Tons, 1972		111756	125743			
Wet Manure I Nutrients in	Defecated: Tons, 1972 Wet Manure: Nitroge Phospho Potash,	n, tons 1330 rus, tons 237				

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	8200	
1969	9045	506
1972	6900	1590
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	11109	20320
Nutrients in Wet Manure: Nitrogen, Tons	155	1210
Phosphorus, Tons	23	
Potash, Tons	111	20 122

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey	Turkeys
1964		189405		
1969		132880		_
1972		150154	4500	4500
Wet Manure Fa	ctor: Lbs. per bird	82.9	365	89.63
Wet Manure De	fecated: Tons, 1972	6224	100	07.03
Nutrients in \	Nitrogen, tons	97	Combined	1023
	Phosphorus, tons Potash, tons	25 22		14

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	L) 269312	Number I-V farms 1016
Number of farms	1599	Acres in I-V farms 202930
Acres in farms	238628	Cropland I-V farms 165026
Cropland in farms	189767	Harvested cropland
Harvested cropland in fa	rms 111706	I-V farms 127329

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	41408	66119	1553	8202
GRAINS	26443	3314	1553 156	3470
Wheat	15649	2125	105	2230
Oats	10109	ווודר	51	1195
Barley	196	5	51	15
Rye	196 155	8	0	8
OTHER FIELD CROPS	147176	2187	206	2393
Soybeans	46806	2120	189	2309
Potatoes	2	0	0	0
Sugar beets		100		
Field beans	1747	0	0	0
HAY OR GRASS SILAGE	12826	266	27	293
PASTURED CROPLAND	8517	84	9	93
Cropland used for pasture	7918	77	9	86
Improved pasture	599	7	0	7
VEGETABLES, SWEET CORN, MELONS	292	79	814	163
ORCHARDS	9	2	0	2
BERRIES	14	1	0	1
NURSERY & GREENHOUSE PRODUCTS	1	0	0	0
OTHER CROPS	123	8	0.	B
Total Fertilizer Used, Tons		12590	2035	11,625
Percant of Fertilizer Used		86	111	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	19519	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Total Liquid	7389 26908	1972			10061
Primary Nutrients in		Tonnages for Other Recent Years			
Fertilizer	13963	1971			13552
Nitrogen	1827	1973			22136
Phosphorus	4129				
Potash	5007				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	3550	
Total Estima As Compute	ted Tons Applied on All Hi	ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide 2474.1		secticides 06.7	Fungicides	Total 2795.h		
Manure: Ki	nd of	Tons of Materials in Wet Manure Defecated					
Livestock		Manur			Potash		
Swine: Table 2		45996	230	64	175		
Cattle: Table 3		237499	1330	237	1187		
Sheep: Table 4		11109	155 140	23	111		
Horses: Table 4		20320	140	203	122		
Chickens: Table 5		6224	97	25	22		
Turkeys: Table 5		1023	16	14	14-		
Total from Livestock, Tons		322171	1968	556	1621		
Fertilizers	:	Tons of	Commercial	Fertilizers Applie	đ		
				imary Nutrients			
Ite	m	Total	Nitrogen	Phosphorus	Potash		
Applied on Cropland: Table 7		26908	4827	1,129	5007		
Lime: Lime Tabl	stone equival	lent purch	ased or appl	ied, tons:			

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

		***************************************	-	ATTENDED A 1 7 A	THOMAS	-	onona		
TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	UN	CROPS,	1972	

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	96831	2662.8	21518	322.7		
Grains	34703	173.5	11568	115.6		
Hay or Grass Silage	5730	57.3	4775	47.7		
Pastured Cropland	1853	18.5	1853	18.5	7	
Other Field Crops	83920	1678.4	5245	52.4		-
Vegetables	2900	92.8	2900	138.0	2900	164.8
Orchards						
Berries	60	4.7	60	9.1	64	10.7
Nursery, Greenhouse	1000					1007
Other Crops						
Totals	225997	4688.0	47919	70h.0	2964	175.5
Total Herbicides, In				0 lbs	276880	5567.5

## TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sows Farrowing			
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	27674	1616	1640	3256	
1969	23093	1218	1179	2397	
1972	23900	1216	1265	2481	

	22.00			
Wet Manure	Factor: Tons	per litter farrowed	d 7.145	
	Defecated: Tor		18483	
Nutrients i	n Wet Manure:	Nitrogen, tons	92	
011/02/01/01/01		Phosphorus, tons	26	
		Potash, tons	70	

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	26473	1,009	22464		
1969	23376	3160	20216		
1972	25500	2835	22665		
Wet Manure 1 Per Animal	actor: Tons	13.14	6.45		
Wet Manure I		37252	146189		
	Defecated: Tons, 19 Wet Manure: Nitr		33hh3. 027		
	Phos	phorus, tons 1	83 17		

## TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	7634	
1969	7160	812
1972	5900	15/18
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	91199	1,9783
Nutrients in Wet Manure: Nitrogen, Tons		137
Phosphorus, Tor		20
Potash, Tons	95	119

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		11,1225		
1969		109996		
1972		124295	-	7500
Wet Manure Fact	or: Lbs. per bird	82.9		89.63
Wet Manure Defe	cated: Tons, 1972	5152		
Nutrients in We	Manure: Nitrogen, tons	80	Combined	336
	Phosphorus, tons	21		1
	Potash, tons	18		1

## TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	396288	Number I-V farms 1531
Number of farms	2181	Acres in I-V farms 341229
Acres in farms	371279	Cropland I-V farms 311309
Cropland in farms	333725	Harvested cropland
Harvested cropland in fa	rms 280223	I-V farms 264569

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	85273	12766	1:30h	17069
GRAINS	57816	7477	342	7819
Wheat	38477	5524	305	5829
Oats	18791	1924	32	1956
Barley	129	8	4	12
Rye	223	6	0	6
OTHER FIELD CROPS	103117	41.60	493	4653
Soybeans	97172	2728	155	2883
Potatoes	12	7	0	7
Sugar beets			1000	
Field beans	384	1	0	1
HAY OR GRASS SILAGE	17375	207	9	216
PASTURED CROPLAND	7568	78	18	96
Cropland used for pasture	6271	73	5	78
Improved pasture	1297	5	13	18
VEGETABLES, SWEET CORN, MELONS	3295	1094	201	1298
ORCHARDS	34	14	0	14
BERRIES	36	6 8	0	6
NURSERY & GREENHOUSE PRODUCTS	26	8	1	9
OTHER CROPS	130	11.	1	2
Total Fertilizer Used, Tons		25802	5371	31173
Percent of Fertilizer Used	4	83	17	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT APPLIED APPLIED

July 1, 1972-June 30, 1973)		1	APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	46225	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	8233	1972			11721
Total	51458				
Primary Nutrients in		1971	nages tot cer	er Recent Yes	15115
Fertilizer	28333	1973			28253
Nitrogen	7879	1-712			distribution of the last
Phosphorus	9913				
Potash	105/11				

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		THE PERSON NAMED IN COLUMN
1972-73	9485	
	rimated Tons Applied on All Hi	ghways in 1972-73,

### TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides	Insec 70L	ticides .0	Fungicides	Total 5567.5		
Manure: Kind of		Tons of Materials in Wet Manure Defecated					
Livestoc		Manure	Nitrogen	Phosphorus	Potasi		
Swine: Tab		18483	92	26	70		
Cattle: Ta		183441	92 1027	183	917		
Sheep: Tab		9499	133	20	95		
Horses: Ta		19783	137	20	719		
Chickens:		5152	80	21	18		
Turkeys: T		336	5	1	1		
Total from Ton	Livestock,	236694	21,74	271	1220		

Fertilizers:	Tons of		tilizers Applie	1
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland:	51,458	7879	9913	10541

	200	The second second	manual again	0.00	ann14ad	FARO.
Lime:	Limestone	equivalent	purchased	OI	abbrren!	LUMO .
	Toble 8	11721				

ı	Out have	Annliad	on	a11	highways,	tons:	Table	9	13757	
ı	Salts:	Applied	OH	arr	Hr Bumay o 3	MOINE.		_		

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms (kg) Hectare (ha) Kilograms (kg) 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds  PLANNING AREA: Lake Erie 4.0 STATE: Ohio  PLANNING SUBAREA: Southwest 4.2 COUNTY: Wyandot  TABLE 1—ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972  TABLE 6—CROF ACREAGES & FERTILIZER USED—CLASS I—V CENSUS FARMS, 1969  Crop Group or Acres Used Acres Used Acres Used Acres Used Acres I Used Acres in I—V farms 854  Number of farms 1196 Acres in I—V farms 224106  Acres in farms 241872 Cropland I—V farms 189672  Crop Treated 100 lbs Treated 1	TABLE 7-41					GREAT LAK	ES BASIN MAT	TERIAL USAGE INVENTORY				
PLANING SUBAREA   Southwest   1.2   OUNTY   Wymndot	THE TOTAL			gricultur	al Chemic	als, Manu	res, Fertil:	zers, Lime and Highway De-Icing C	ompounds			
Table 1 - STIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972   Table 6 - CROP ACREAGES & FERTILIZER USED - CLASS I-V CENSUS FARMS, 1969			1	LANNING A	REA:	Lake Erie	4.0	STATE: Ohio				
Rerbicides			1	LANNING S	UBAREA:	Southwest	4.2	COUNTY: Wyandot				
Acres   Acre	TABLE 1-ESTIMATED	AMOUNTS OF	CHEMICA	LS USED OF	N CROPS, I	1972		TABLE 6CROP ACREAGES & FERTIL	IZER USE	DCLASS I-V	CENSUS FARMS,	1969
Acres   Acre		Herbi	cides	Insect	ticides	Fune	cides	(1)				0
Acres   Used   Acres   Used   Acres   Used   Acres   Used   Cropland in farms   20,1372   Crop			Amount		Amount		Amount	COUNTY, land area, acres				
Crops			CONTRACTOR AND ADDRESS OF THE PARTY OF THE P	The state of the s	A LIVE OF A SECOND	Control of the Contro	Wild Child Co. No. of					
Coratins   18180   92.41   0.506   61.6   61.6	Crops	Treated	100 lbs	Treated	100 lbs	Treated	100 lbs			Harvested	cropland	
Ray or Grass Silage   2820   28,2   2350   23,5	Corn	55237	1519.0	12275	184.1					L	I-V farms 11	16922
Ray or Grass Silage   2820   28,2   2350   23,5		18480							1			
Pastured Gropland   3112   31.1   3112   31.1   31.2   31.2   31.5   36.5   3	Hay or Grass Silage								C	rop Tor	ns of Fertiliz	er Used
Vegetables   329   10.5   329   15.7   329   18.7   329   325			31.1		31.1			Crops	A	cres Dry	Liquid	Total
Vagetacles   327   10.1   329		58480	1169.6	3655				CODN	1.707	3 4000	0700	0000
Serries   70   3.7   79   11.2   82   19.1		329	10.5	329	15.7	329	18.7			0 3836	262	
Dats   Sage						2						
Barley   18		70	3.7	79	14.2	82	19.4					
Comparison   Contract   Cost/Shared   Cos												
OTHER FIELD CROPS   59621   1276   153   11/29	Other Crops											
Soybeans   57995   1036   121   1157												
Potatoes   138528   2854,5   27960   366,7   411   38,1   Total Herbicides, Insecticides, Fungicides: 100 lbs   166899   3259,3   Fleid beans   751   0   0   107   10					100							
Totals												
Total Herbicides, Insecticides: 100 lbs   168899   3259.3												
TABLE 2—MANURE FROM SWINE    Hog & Pig									754	0	0	0
Hog & Pig	Total Herbicides, In	nsecticide	es, Fungi	cides: 10	00 1bs	100033	3259.3	HAY OR GRASS SILAGE		107	0	107
Hog & Pig   Number Sows Farrowing   Inventory   Dec. 1-May 31   June 1-Nov. 30   Improved pasture   1508   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   17   VECETABLES, SWEET CORN, MELONS   374   116   36   152   17   0   1	TABLE 2 MANITED FOO	M CUTATE						PASTURED CROPLAND	1271	3 64	0	
Treat   Total   Tota	TABLE 2-PANURS PRO	LI DATAD						Cropland used for pasture	1123	5 47	0	
Transmit	Han E Pf	g   N	Jumber So	re Farrour	ing			Improved pasture	1508	17	0	17
Year   Dec. 1   Spring   Fail   Total		0					- 11	VEGETABLES, SWEET CORN, MELONS	374	116	36	152
1964   39881   4538   3394   3095   5489   1972   35600   33848   3394   3095   5489   1972   35600   33844   3481   5825   1972   100   0   0   0   0   0   0   0   0						Total	1	ORCHARDS	89	23		23
1969   33848   3394   3095   6489   OTHER CROPS   70 0 0 0 0 0								BERRIES		1		
1972   35600   33M1   3481   6825   Total Fertilizer Used, Tons   1212   3239   15651									1	0		
Wet Manure Factor: Tons per litter farrowed 7.45  Wet Manure Defecated: Tons, 1972 50.64.6  Nutrients in Wet Manure: Nitrogen, tons 254 Phosphorus, tons 71 Potash, tons 193  TABLE 3—MANURE FROM CATTLE  Number Cattle and Calves Cows & Heifers   Heifers, Steers, Calved   Bulls, Calves   Pertilizer   13278   Percent of Fertilizer   Used   79 21 100  TABLE 7—FERTILIZER USED IN 1972  TABLE 8—GROUND LIMESTONE EQUIVALENT   Tonnage   Tonnag									70			
Wet Manure Defecated: Tons, 1972 50816  Nutrients in Wet Manure: Nitrogen, tons 251 71 701 701 701 701 701 701 701 701 701	1972 35600	33	SULL	3440	01	582	2					
Wet Manure Defecated: Tons, 1972 50816 Nutrients in Wet Manure: Nitrogen, tons 254 Phosphorus, tons 71 Potash, tons 193  TABLE 7-FERTILIZER USED IN 1972    Table 8-GROUND LIMESTONE EQUIVALENT	Wet Manure Factor:	Tons per	litter f	arrowed	7.45			Percent of Fertilizer Used		79	21	100
Nutrients in Wet Manure: Nitrogen, tons 25L Phosphorus, tons 71												
Phosphorus, tons   71				ons	254			TABLE 7FERTILIZER USED IN 197	2 TABLE	8-GROUND L	IMESTONE EQUIV	VALENT
TABLE 3—MANURE FROM CATTLE    Tons   Tons   Tonnage Government   Total   Tons   Tonnage Government   Total   Tonnage   Tonnage					71							
Fertilizer Used on Crops: Solid 19625  Number Cattle and Calves  Cows & Heifers   Heifers, Steers, Calved   Bulls, Calves   Fertilizer   13278   Government   Total   Government   Total   Tot		Pot	tash, ton	S	193					March 1 mar	West was well	
TABLE 3—MANURE FROM CATTLE  on Crops: Solid 19625 Liquid 7067 Total 7067  Number Cattle and Calves Cows & Heifers   Heifers   Steers   Year Total Calved Bulls   Calves   Fertilizer 13278  Year Cost/Shared Cost/Shared Tonnage 1972 Tonnages for Other Recent Years 16902 1973 10973 10973		-	mile vingle/s					Wantildow Wash				Total
Number Cattle and Calves    Number Cattle and Calves   Liquid 7067   1972   Li8431											The state of the s	The second second
Number Cattle and Calves  Cows & Heifers   Heifers, Steers, Primary Nutrients in Calved   Bulls, Calves   Fertilizer   13278   1971   1972   1973   1973   1973   1973   1974   1975   1	TABLE 3-MANURE FRO	M CATTLE							rear	Cost/Snared	Cost/Snared	
Year Total Calved Bulls, Calves Fertilizer 13278 Tonnages for Other Recent Years  Year Total Calved Bulls, Calves Fertilizer 13278 1971 1.6902				500 70	120 120	Variation						
Year Total Calved Bulls, Calves Fertilizer 13278 1971 16902 12320							-		Ton	nages for Ot	her Recent Yea	ars
	W-1000	D.#	C									
	iear To	cal		Calve	a a	Bulls	Laives		1973			1 43340

		Number Cattle and Calves					
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	17792	5553	12239				
1969	13145	3862 4347	9283				
1972	171500	4347	9853				
Wet Manure 1 Per Animal	actor: Tobs	13.14	6.45				
Wet Manure I		57120	63552				
	Defecated: Tons, 1972 Wet Manure: Nitroge Phospho Potash,	orus, tons 67	Î .				

Year Item	Sheep & Lambs	Horses & Ponies
1964	27893	
1969	22015	381
1972	20700	1001
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	33327	12793
Nutrients in Wet Manure: Nitrogen, Tons	467	88
Phosphorus, Tons	70	13
Potash, Tons	333	77

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		100935		
1969		113338		
1972		128072		
Wet Manure Facto	r: Lbs. per bird	82.9		
Wet Manure Defec	ated: Tons, 1972	5309		
Nutrients in Wet	Nitrogen, tons	83	Combined	5 19
	Phosphorus, tons	21		
	Potash, tons	19	Contraction to the	

Liquid	26692	1972		48431
otal	20092	Tonn	ages for Other	Recent Years
rimary Nutrients in Fertilizer	13278	1971		46902
litrogen	3955	1973		1 13340
hosphorus	4377			
otash	4946			
TABLE 9SALTS APPLIE	THE STATE OF			and the second second
	Tons Purch	ased	Tons App	NICIPAL HIGHWAYS
Year 1970-71	Tons Purch	ased	Tons App	olied Per
Year	Tons Purch	ased	Tons App	olied Per

Themicals:	Hund	redweight	Applied on C	Cropland	
Table 1	Herbicides 2854.5	Ins. 366	ecticides	Fungicides 38.1	Total 3259.3
Manure: Kin	nd of	Tons	of Material	s in Wet Manure	Defecated
Livestock	t I	Manure	Nitroge	n Phosphorus	Potash
Swine: Tabl	Le 2	50846	254	71	193
Cattle: Tal	ole 3	120672	676	121	603
Sheep: Tab	le 4	33327	467	70	333
Horses: Table 4 Chickens: Table 5		12793	88	13	77
		5309	83	21	19
Turkeys: Ta	able 5				
Total from Tone	Livestock,	222947	1568	293	1225
Fertilizers		Tons of	Commercial F	Fertilizers Appli	ed
			Pri	mary Nutrients	
Ite	n	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	26692	3955	4377	4946

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

(1) County, land area, acres includes water areas under 40 acres in size.

## 7.3.2.1 Agricultural Chemicals

Total chemical use is low compared to the entire Basin. However, the corn and soybeans grown here are crops requiring primarily herbicides. Herbicides represented 83 percent of all chemicals used, with insecticides 13 percent and fungicides only 4. This was the highest herbicide percentage figure of any Basin subarea. It is projected that chemical usage in this subarea may increase 10-25 percent in the next 10 years with herbicide increase near the top of this range. In 1972 there were 3,607,980 kilograms (7.954,280 lbs) of agricultural chemicals used in PSA 4.2.

## 7.3.2.2 Animal Wastes

Cattle and swine numbers in the planning subarea represented the equivalent of about 20 percent of Ohio's cattle total and about 23 percent of Ohio's swine total. Cattle and swine produce 82 percent of the manure tonnage. Swine produced 19 percent of all manure — the highest percent for any Basin subarea. Livestock income relative to income from crops and other sources will likely continue in about the same relationship as now in the next 10 years. Thus, the index of manure production should remain about the same. The figure for 1972 was 5,727,000 metric tons (6,312,949 tons) of livestock manure defecated. Nitrogen, phosphorus, and potash combined comprises 1.3 percent of the total manure tonnage.

## 7.3.2.3 Commercial Fertilizers

Commercial fertilizer use is about 7 percent above Basin average. Nitrogen represented 31 percent, phosphorus 32, and potash 37 percent of the nutrients used. Fertilization rates, as estimated by some soil scientists, will increase by perhaps 20-25 percent in this corn belt subarea in the next 10 years. In 1972 the amount used in Planning Subarea 4.2 was 590,838 metric tons (651,276 tons) of commercial fertilizers.

## 7.3.2.4 Lime

Planning Subarea 4.2 had 278,337 metric tons (306,809 tons) of limestone either purchased or applied to croplands in 1972. Lime usage should remain about the same as the present level. If any change does occur it is more likely to be down rather than up.

## 7.3.2.5 Salts

This area uses the least amount of road de-icing salts in the lake basin. For 1972-73 the total was 104,482 metric tons (115,170 tons) of salt. Future use of road salts in this subarea will likely continue to be near these modest levels.

## 7.4 Planning Subarea 4.3

This planning subarea extends from one county west of Cleveland east to the Pennsylvania border. Four of the eight counties border on Lake Erie and the others are one county removed. There are a number of metropolitan counties in the subarea, in addition to Cleveland.

## 7.4.1 Agricultural Characteristics

This subarea is on the eastern border of the cornbelt. Corn and soybeans are two of the major crops grown. There are over 20,250 hectares (50,000 acres) of grains, mostly wheat. The value of crops produced per acre is below that of most counties to the west.

Table 7-42 indicates the relative proportions of materials usage in Planning Subarea 4.3 in comparison with the total Great Lakes Basin.

Table 7-42

MATERIALS USAGE BASIN RELATIONSHIP - PSA 4.3 TO GREAT LAKES

Per harvested acre of cropland	Planning Subarea 4.3	Great Lakes Basin
Lbs of chemicals applied Index of chemicals used	2.25 85	2.66 100
Tons of livestock manure defecated Index of manure defecated	5.39 160	3.37 100
Lbs primary nutrients in livestock ma Index primary nutrients in manure	nure 134 163	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	273 2 85	321 22 100
Lbs primary nutrients in commercial in Index primary nutrients in commercial	Fertilizer 134 fertilizer 88	153 100
Lbs of lime applied Index of lime applied	485 285	170 100
Per acre of total land area		
Lbs of road salts used Index road salts used	117.55 282	41.74 100
Pounds (1b) Tons (ton)  Kilo	To grams (kg) grams (kg) ic Tons	Multiply By 0.454 907.2 0.907

## 7.4.2 Materials Usage

Table 7-43 lists by county the material usage inventory for PSA 4.3. Detailed statistics are shown in Tables 7-44 to 7-52.

Table 7-43
MATERIALS USAGE
(in 1972)

PSA 4.3	Chemicals Applied to Crops (100 Lbs)	Livestock Manure (tons)	Commercial Fertilizer on Cropland (tons)	Limestone Purchased or Applied (tons)	Salts Applied to all Highways (tons)
Ohio					
Ashtabula	1767	424848	10821	20728	28718
Cuyahoga	241	40512	1984	20728	29505
Geauga	337	224320	1649	3038	21054
Lake	456	29586	976	445	8833
Lorain	1946	295955	9630	9790	6035
Medina	996	351703	8283	9568	15213
Portage	954	249850	8005	8822	13054
Summit	289	71281	1378	2771	13634
TOTAL	7026	1688055	42726	75890	136046
To Convert	From		To	M	ultiply By
Pounds (1b)			ilograms (kg)		0.454
Tons (ton)			ilograms (kg)		907.2
		M	etric Tons		0.907

## 7.4.2.1 Agricultural Chemicals

Chemical usage is not heavy in the subarea. Most of the herbicides are used on corn and soybeans. All of the fungicides and over half of the insecticides are used on fruit and vegetable crops. About 80 percent of the fruit in the subarea is grown in three counties along the lake and 80 percent of the vegetable production is concentrated in 4 counties. Chemical usage may increase 3 to 15 percent in this planning subarea. In 1972 there were 319,000 kilograms (702,680 lbs) of agricultural chemicals used in this subarea.

## 7.4.2.2 Animal Wastes

Cattle accounted for 76 percent of the livestock manure, horses 19, swine and chickens each 2 and sheep 1 percent. The horse population is primarily because of the metropolitan centers in the planning subarea. Cattle, especially cows, and horses produce considerable manure per animal. Manure production per harvested crop acre was well above the Great Lakes Basin average. Had manure production been equated with total crop acres the figure would still have been very high. Livestock manure production is projected to continue at about present levels or perhaps slightly downward in the next 10 years. The 1972 level was 1,531,400 metric tons (1,688,055 tons) of wet manure. Nitrogen, phosphorus, and potash combined, comprise 1.2 percent of the total manure tonnage.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Ohio COUNTY: 8 County Totals PLANNING SUBAREA: Central 4.3

	Herbi	cides	Insec	ticides	Fung	icides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres	Amount Used 100 1bs
Corn	73785	2028.7	16397	245.7		
Grains	32456	162.1	10818	108.0		
Hay or Grass Silage	33900	339.0	28250	282.3		
Pastured Cropland	19197	191.6	19197	191.6		
Other Field Crops	19197 35520	710.4	2220	22.2		
Vegetables	4551	145.5	4551	216.7	4551	258.8
Orchards		12.0	10//10		4274	230.0
Berries	3908	194.7	11161	810.3	4590	1119.2
Nursery, Greenhouse					72.20	John Jak
Other Crops						
Totals	203317	3772.0	8589)	1876.8	91/1	1378.0
Total Herbicides, In	secticide	s, Fungic	ides: 10	0 1bs	298352	7026.8

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1		June 1-Nov. 30 Fall	Total
1964	29845	2703	2724	£1.07
1969	27803	1932	1958	3800
1972	28950	1990	2072	1,062

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons Potash, tons

		Number Cattle	and Calves	
Year Total		Cows & Heifers Calved	Heifers, Steers, Bulls, Calves	
1964	119140	62589	56551	
1969	99521	51704	47817	
1972 108400		86589	21811	
Wet Manure Per Anima	Factor: Tons	13.14	6.45	
Wet Manure Tons, 197		1137779	140681	
Wet Manure Nutrients i	Defecated: Tons, 1972 n Wet Manure: Nitroge Phospho Potash,	n, tons 7159 rus, tons 1278	50	

TARLE 4-MANUER FROM SUPER AND HORSES

Year	Item	Sheep & Lambs	Horses & Ponies
1964		19184	
1969		16052	7726
1972		9100	7726 25548
Wet Manure Factor: To	ons per animal	1.61	12.78
Wet Manure Defecated:	Tons, 1972	14651	326503
Nutrients in Wet Manu	re: Nitrogen, Tons	205	2253
	Phosphorus, Tons	31	
	Potash, Tons	3/17	327

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey	Turkey
1964	953662		
1969	651,113		
1972	739148		
Wet Manure Factor: Lbs. per bird	82.9	365.0	Po 60
Wet Manure Defecated: Tons, 1972	30638	305.0	B9.63
Nutrients in Wet Manure: Nitrogen, tons	1,78		541 18
Phosphorus, tons Potash, tons	122	3	2

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)

COUNTY, land area, acres (2)

Number of farms 6613

Acres in farms 751147

Ly6601 Number I-V farms 3246 Acres in I-V farms 528123 Cropland I-V farms 367344 Harvested cropland
I-V farms 258683 Harvested cropland in farms 312904

	Crop	Tons	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Tota		
CORN	73292	13907	1172	15079		
GRAINS	53382	7317	33	7380		
Wheat	20552	2958	19	2977		
Oats	27692	3766	111	3777		
Barley	1356	190		190		
Rye	597	145	1	146		
OTHER FIELD CROPS	30490	2968	17	2985		
Soybeans	27737	1333	13	1346		
Potatoes	2547	1573	-	1573		
Sugar beets		1212		+2/2		
Field beans	3014	18	-	18		
HAY OR GRASS SILAGE	8730h	1939	26	1965		
PASTURED CROPLAND	6021/6	940	23	963		
Cropland used for pasture	48443	723	1	727		
Improved pasture	11803	217	19	236		
VEGETABLES, SWEET CORN, MELONS	5172	11/19	71	1520		
ORCHARDS	5248	831	1	832		
BERRIES	234	67	1	68		
NURSERY & GREENHOUSE PRODUCTS	5323	1515	69	1584		
OTHER CROPS	70	10	07	10		
Total Fertilizer Used, Tons		30991	21/23	-		
Percent of Fertilizer Used	No. 17 1	96	1	32404		

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

Item Tons Fertilizer Used on Crops: Solid Total Primary Nutrients in Fertilizer Nitrogen Phosphorus Potash

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HICHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72	COLUMN TO SERVICE STATE OF THE	
1972-73	93799	
Total Est: As Com	imated Tons Applied on All Hi outed 136046	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Insec	ticides	Fungicides	Total
Table 1	3772.0	1876.8		1378.0	7026.8
Manure: Kind	of	Tons o	f Materials	in Wet Manure	Defecated
Livestock		Manure	Nitroger	Phosphorus	Potash
Swine: Table :		262	151	1,2	115
Cattle: Table		78460	7159	1278	6392
Sheep: Table		651	205	31	71/7
Horses: Table		6503	2253	327	1959
Chickens: Tab	e 5 30	638	1478	122	107
Turkeys: Table		41	118	30	26
Total from Live Tons	stock	88055	10364	1830	8746
Fertilizers:	Т	ons of Co	mmercial Fe	rtilizers Appli	ed
Item	70	La to		ary Nutrients	T married

Nitrogen Phosphorus Potash Applied on Cropland: Table 7 42726 5925 7980

Lime: Limestone equivalent purchased or applied, tons:

Salts: Applied on all highways, tons: Table 9 136046

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

PLANNING AREA:	Lake Erie 4.0	STATE:	Ohio
PLANNING SUBAREA:	Central 4.3	COUNTY:	Ashtabula

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972	

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	16027	hh0.7	3562	53.4		
Grains	5977	29.8	1992	19.9		
Hay or Grass Silage	8940	89.4	7450	74.5		
Pastured Cropland	5873	58.7	5873	58.7		
Other Field Crops	1600	32.0	100	1.0		
Vegetables	21/1	7.7	21/1	11.5	Slil	13.7
Orchards						
Berries	1578	74.6	1820	334.6	1867	466.6
Nursery, Greenhouse						
Other Crops						
Totals	10236	732.9	21038	553-6	23.08	1.80.3
Total Herbicides, In					63382	1766.8

	TABLE	2MANURE	FROM	SWINE
--	-------	---------	------	-------

ear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	3839	309	368	677
1969	5345	290	369	659
1972	5500	333	345	678

Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

		Number Cattle	Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves			
1964	31313	17219	11/09/			
1969	28583	15517	13066			
1972	31900	27594	4306			
Wet Manure   Per Anima	Factor: Tons	13,14	6.45			
Wet Manure 1		362585	27774			
Wet Manure 1	Defecated: Tons, 1 n Wet Manure: Nit	972 Combined: 390 rogen, tons 218	359 6			
		sphorus, tons 390				

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2708	
1969	2284	7.03/1
1972	1200	1906
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1932	214359
Nutrients in Wet Manure: Nitrogen, Tons	27	168
Phosphorus, Tons	4	24
Potash, Tons	19	146

TABLE 5-MANUER FROM CHICKENS & TURKS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	98091		
1969	67178		
1972	75911		
Wet Manure Factor: Lbs. per bird	82.9		
wet Manure Defecated: Tons, 1972	3147		
Nutrients in Wet Manure: Nitrogen, tons	49	Combined	
Phosphorus, tons	13		
Potash, tons	11		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	1118728	Number I-V farms	690
Number of farms	1500	Acres in I-V farms	126314
Acres in farms	191993	Cropland I-V farms	80509
Cropland in farms	114396	Harvested cropland	
Harvested cropland in farm	s 66068	I-V farms	52735

	Crop	Tons (	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	14571	2707	264	2971
GRAINS	10251	1527	7	1534
Wheat	2215	375	2	377
Oats	7093	1036	5	1011
Barley	178	23	0	23
Rye	24	3	0	3
OTHER FIELD CROPS	1077	174	9	183
Soybeans	882	66	9	75
Potatoes	194	2.07	0	107
Sugar beets				
Field beans	795	7	0	7
HAY OR GRASS SILAGE	23879	493	16	509
PASTURED CROPLAND	19658	338	10	348
Cropland used for pasture	15814	288	9	289 59
Improved pasture	3814	50	9	59
VEGETABLES, SWEET CORN, MELONS	274	53	30	83
ORCHARDS	2225	423	0	1,23
BERRIES	20	10	0	2.0
NURSERY & GREENHOUSE PRODUCTS	151	35	5	40
OTHER CROPS	24	7	0	7
Total Fertilizer Used, Tons		5774 94	3/11	6115
Percent of Fertilizer Used		94	6	100

TABLE 7FERTILIZER USED IN 1972 (July 1, 1972-June 30, 1973)		TABLE	8GROUND LI APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	10155	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	666	1972			20728
Total	10821		nages for Oth	er Recent Yea	rs
Primary Nutrients in Fertilizer	5686	1971	nageo eve ven		26079 25829
Nitrogen	1749	1973			25829
Phosphorus	1803				
The second	07.01.				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	19800	
Total Estima As Comput	ted Tons Applied on All Hi ed 28718	ghways in 1972-73,

CIDMARY OF ACRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbi	cides		ecticides	Fungicides	Total 1766.8
Table 1 73	2.9	55	53.6	480.3	1/00.0
Manure: Kind of		Tons	of Materials	in Wet Manure I	efecated
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2		5051	25	7	19
Cattle: Table 3		390359	2186	390	1952
Sheep: Table 4		1932	27	4	19
Horses: Table 4		24359	1.68	SI	
Chickens: Table 5		3147	49	13	11
Turkeys: Table 5		0			
Total from Liveston Tons	k,	424848	2455	438	2147
Fertilizers:		Tons of		rtilizers Applie	d
				ary Nutrients	1
Item		Total	Nitrogen	Phosphorus	Potasi
Applied on Croplane Table 7	1:	10821	1749	1803	2134

Table 8 20728

Salts: Applied on all highways, tons: Table 9 28718

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Ohio

COUNTY: Cuyahoga PLANNING SUBAREA: Central 4.3

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	900	24.7	200	3.0		-
Grains	900	4.5	300	3.0		
Hay or Grass Silage	900 450	4.5	375	3.7		
Pastured Cropland	197	1.9	197	1.9		
Other Field Crops	800	16.0	50	.5		
Vegetables	756	24.2	756	36.0	756	43.0
Orchards						
Berries	138	7.0	157	28.4	162	39.2
Nursery, Greenhouse						
Other Crops						
Totals	1010	82.8	2035	76.5	918	82.2

	TABLE	2MANI	URE	FROM	SWINE
--	-------	-------	-----	------	-------

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	336	8	4	12
1969	150	15	7	22
1972	350	25	26	51

Wet Manure Factor: Tons	per litter farrowed	7.45	
Wet Manure Defecated: Ton		380	
Nutrients in Wet Manure:		2	
	Phosphorus, tons	1	
	Potash, tons		

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	792	290	502			
1969 1972	771	290 359 500	412 500			
Wet Manure Per Anim	Factor: Tons	13.14	6.45			
Wet Manure Tons, 19	Defecated:	6570	3225			
	Defecated: Tons, 1972 in Wet Manure: Nitroge Phospho Potash,	on, tons	9795 55 10			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	607	
1969	607 351	696
1972	300	2287
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	483	29228
Nutrients in Wet Manure: Nitrogen, Tons	7	202
Phosphorus, Tons	1	29
Potash, Tons	5	175

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	23363		
1969	13362		
1972	15099		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	626		
Nutrients in Wet Manure: Nitrogen, tons	10	Combined	
Phosphorus, tons	3		
Potash, tons	2		0.77

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	(L) 201810	Number I-V farms 162
Number of farms	272	Acres in I-V farms 6761
cres in farms	10782	Cropland I-V farms 4332
Cropland in farms	5730	Harvested cropland
larvested cropland in f	arms 1074	I-V farms 3401

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	533	52,	2	56
GRAINS	489	39	0	39
Wheat	210	15	0	15
Oats	268		0	214
Barley	6	0	. 0	0
Rye	0	0	0	0
OTHER FIELD CROPS	416	15	0	15
Soybeans	416	15	0	15
Potatoes				
Sugar beets				
Field beans				
HAY OR GRASS SILAGE	567	26	0	26
PASTURED CROPLAND	521	10	0	10
Cropland used for pasture	369	6	0	6
Improved pasture	152	14	0	1
VEGETABLES, SWEET CORN, MELONS	859	203	0	203
ORCHARDS	183	24	0	211
BERRIES	10	1	0	1
NURSERY & GREENHOUSE PRODUCTS	126	163	21	181
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		535 96	23	558
Percent of Fertilizer Used	The Section	96	4	100

Item	Tons
Fertilizer Used on Crops: Solid	1982
Liquid	2
Total	1984
Primary Nutrients in Fertilizer	763
Nitrogen	287
Phosphorus	259
Potash	217

July 1, 1972-July 30	, 1973)		APPLIED		-
Item	Tons		Tonnage	Tonnage not	-
Fertilizer Used on Crops: Solid	1982	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	2	1972			20728
Total	1984		nages for Oth	er Recent Yes	
Primary Nutrients in Fertilizer	763	1971	maged for our		26079
Nitrogen	287	19.13			67067
Phosphorus	259				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	20343	
Total Estima As Comput	ted Tons Applied on All Hi	ighways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbicide		ecticides	Fungicides	Total
Table 1 82.8	75	5.5	82.2	241.5
Manure: Kind of	Tons	of Materials	in Wet Manure D	efecated
Livestock	Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2	380	2	1	1
Cattle: Table 3	9770	55	10	49
Sheep: Table 4	1,83	7	1	5
Horses: Table 4	29228	202	29	175
Chickens: Table 5	626	10	3	2
Turkeys: Table 5	0	0	0	0
Total from Livestock, Tons	hoh87	276	lila	232
Fertilizers:	Tons of		tilizers Applie	d
		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potas
Applied on Cropland: Table 7	1984	287	259	217

Lime: Limestone equivalent purchased or applied, tons: Table 8 20728

Salts: Applied on all highways, tons: Table 9 29505

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453

PLANNING AREA: Lake Erie 4.0 STATE: Ohio PLANNING SUBAREA: Central 4.3 COUNTY: Geauga

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS	1972

Amount Used 100 1b	Acres	Amount Used 100 lbs	Acres	Amount Used
	91.0		rreared	
12-27 (012-20)	142	11.1		
13.7	915	9.1		
14.7	3725	37.2		
21.8	2186	21.8		
16.0	50	.5		
3.4	107	5.1	107	6.1
8.4	198	36.2	5011	50.2
100.8	7923	121.0	311	56.3
	199.8 ides, Fung			

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	3948	1,62	151	916
1964 1969 1972	1748	208	227	435
1972	1700	207	216	423

Wet Manure Factor: Tons	per litter farrowed	7.45
Wet Manure Defecated: Ton	s, 1972 —	3151
Nutrients in Wet Manure:	Nitrogen, tons	16
	Phosphorus, tons	lı .
	Potash, tons	12

20		Number Cattle and Calves				
Year	Total	Cows & H		Heifers, Steers Bulls, Calves		
1964	12166	710		5057		
1969	9322	51430		3892		
1972	9900	9800	)	100		
Wet Manure Per Anima	Factor: Tons	13.	111	6.45		
Wet Manure Defecated: Tons, 1972		128	772	645		
		Nitrogen, tons Phosphorus, tons	129h1 725 129	7.		
		Potash, tons	647			

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep Lambs	The state of the s
1964	1010	
1969	1.069	11/73
1972	800	6072
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1,288	77600
Nutrients in Wet Manure: Nitrogen,	Tons 18	535
Phosphorus		78
Potash, To	ons 73	1,66

## TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	tem	Chickens	Turkey Hens	Turkeys Raised
1964		223685		
1969		113655		
1972		128430	12000	120000
Wet Manure Factor: Lbs.	per bird	82.9	365	89.63
Tanure Defecated T	one 1972	5323	-	
Nutrients in Wet Manure: Nitrogen, tons		83	Combined 7	5111
Phospho	rus, tons	21		
Potash,	tons	19	3 2	6

COUNTY, land area, acre	260L80	Number I-V farms 301
Number of farms	578	Acres in I-V farms 48088
Acres in farms	69527	Cropland I-V farms 26982
Cropland in farms	38610	Harvested cropland
Harvested cropland in f	arms 22721	I-V farms 18165

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	14673	856	50	906
GRAINS	4361	597	0	597
Wheat	803	597 114	0	27/4
Oats	318h	436	0	436
Barley	281	40	0	40
Rye	23	3	0	3
OTHER FIELD CROPS	23 33	3 13	0	13
Soybeans	111		0	2
Potatoes	19	2	0	11
Sugar beets				
Field beans	27	0	0	0
HAY OR GRASS SILAGE	8683	55	6	61
PASTURED CROPLAND	6913	55 81	13	94
Cropland used for pasture	5373	43	3	46
Improved pasture	1540	38	10	148
VEGETABLES, SWEET CORN, MELONS	122	30	0	30
ORCHARDS	237	36	1	37
BERRIES	7	1	0	11
NURSERY & GREENHOUSE PRODUCTS	66	J.	1	E
OTHER CROPS	0	0	. 0	5
Total Fertilizer Used, Tons		1673	71	1711
Percent of Fertilizer Used		96	4	100

## TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

(July 1, 1972-June 30, 1973)			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	1640	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	9	1972			3038
Total	1019		nages for Orb	er Recent Yea	
Primary Nutrients in Fertilizer	751	1971		er Recent 16a	3209
Nitrogen	186	1973			3280
Phosphorus	281				
Potash	281				

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	14516	
Total Estima	ited Tons Applied on All His	ghways in 1972-73,

	Herbicides	Ins	ecticides		ngicides	Total	
Table 1 199.8		1	21.0	56	56.3 3		
Manure: Kind of Livestock		Tons of Materials in Wet Manure Defecated					
		Manure	Nitroge	en I	hosphorus	Potash	
Swine: Table	2	3151	16		4	12	
Cattle: Table 3		129417	725		1.29	617	
Sheep: Table 4		1288	18		3	13	
Horses: Table 4		77600	535 83		78	1,66	
Chickens: Table 5		5323			21	19	
Turkeys: Table 5		7568	118		30	26	
Total from Livestock, Tons		224347	11,95	39	265	1183	
Fertilizers:		Tons of	Commercial F			đ	
					strients		
Item		Total	Nitrogen	Pf	nosphorus	Potash	
Applied on Cro Table 7	opland:	1649	186		284	281	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 21054

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime a	nd Highway	De-Icing	Compounds
					14070		

PLANNING	AREA:	Lake Erie 4.0	STATE:	Ohio
PLANNING	SUBAREA:	Central 4.3	COUNTY;	Lake

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMI CALS	USED	ON	CROPS.	1972	

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	11/15	31.4	254	3.8		
Grains	900	4.5	300	3.0		
Hay or Grass Silage	660	6.6	550	5.5		
Pastured Cropland	262	2.6	262	2.6		
Other Field Crops	800	16.0	50	.5		
Vegetables	1189	15.6	489	23.3	1,89	27.8
Orchards						
Berries	580	29.6	659	119.1	679	163.8
Nursery, Greenhouse			-			-
Other Crops						
Totals	1,836	106.3	2564	157.8	1168	119.6
Total Herbicides, In		Punal a	ides: 10		8568	455.7

TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	542	29	1.5	7).
1969	193	28	23	51
1972	250	32	3/1	66

Wet Manure Factor: Tons	per litter farrowed	7.45
Wet Manure Defecated: Ton		1192
Nutrients in Wet Manure:	Nitrogen, tons	2
	Phosphorus, tons	1
	Potash, tons	2

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	1652	653	999
1969	11/11	653 349	792
1972	1100	500	600
Wet Manure   Per Anima	Factor: Tons	13.14	6.45
Wet Manure I Tons, 1972		6570	3870
	Defecated: Tons, 197 Wet Manure: Nitro	Section 1985 Section 1985	10hho 58
			10
			52

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	531	
1969	336	193
1972	300	1199
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	483	15323
Nutrients in Wet Manure: Nitrogen, Tons	7	106
Phosphorus, Tons	1	15
Potash, Tons	5	92

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	14281		
1969	60802		
1972	68706		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	2848		
Nutrients in Wet Manure: Nitrogen, tons	1,1,	Combined	
Phosphorus, tons	11		
Potash, tons	10	The second section	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	1/18032	Number I-V farms	
Number of farms	306	Acres in I-V farms	15534
Acres in farms	21159	Cropland I-V farms	11042
Cropland in farms	14169	Harvested cropland	
Harvested cropland in far	ms 8938	I-V farms	759).

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	836	91	2	93
GRAINS	846	100	0	100
Wheat		29	0	29
Oats	316 1445	62	0	62
Barley	35	6	0	6
Rye	30	2	0	6 2
OTHER FIELD CROPS	138	56	0	56
Soybeans	78		0	8
Potatoes	78	8 48	0	8
Sugar beets				
Field beans	30	8	0	8
HAY OR GRASS SILAGE	1166	10	0	10
PASTURED CROPLAND	601	3	0	3
Cropland used for pasture	490	3	0	3
Improved pasture	111	0	0	0
VEGETABLES, SWEET CORN, MELONS	556	205	0	205
ORCHARDS	762	11/9	0	7/19
BERRIES	147	7	0.	7
NURSERY & GREENHOUSE PRODUCTS	3248	732	16	748
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		1361	18	1379
Percent of Fertilizer Used		99	1	100

(July 1, 1972-June 30,		TABLE	APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	976	Year	Government	Government Cost/Shared	Total
Liquid	0	2020			112

Fertilizer Used on Crops: Solid	976	Year		Government Cost/Shared	Total Tonnage
Liquid	0	2070			11.0
Total	976	1972			1445
Primary Nutrients in			nages for Oth	er Recent Yea	TS
Fertilizer	389	1971			835
Nitrogen	102	1973			581
Phosphorus	11/1				
Potash	71/3				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	6090	
Total Estin	nated Tons Applied on All Hi	ghways in 1972-73,

# TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Chemicals:	micals: Hundredweight Applied on Cropland					
Table 1	Herbicides 106.3	Insec	ticides 8	Fungicides	Total 455.7	
Manure: Kind of		Tons of Materials in Wet Manure Defecated				
Livestock		Manure	Nitrogen	Phosphorus	Potash	
Swine: Tabl	e 2	1192	2	7	2	
Cattle: Tab	le 3	10440	58	10	52	
Sheep: Tabl	e 4	483	7	1	5	
Rorses: Tab	1e 4	15323	106	15	92	
Chickens: T	able 5	2848	lili	11	1.0	
Turkeys: Ta	ble 5	0				
Total from L Tons		29586	217	38	161	

Fertilizers:	Tons of	Commercial Fer	tilizers Applied	
		Prima	ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	976	102	144	1143

Lime: Limestone equivalent purchased or applied, tons:
Table 8 445

Salts: Applied on all highways, tons: Table 9 8833

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

PLANNING AREA: Lake Erie 4.0 \_ STATE: Ohio PLANNING SUBAREA: Central 4.3 COUNTY: Lorain

1-PSTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	20/116	561.4	4537	68.0		
Grains	71111	37.2	2480	24.8		
Hay or Grass Silage	4620	46.2	3850	38.5		
Pastured Cropland	3520	35.2	3520	35.2		
Other Field Crops	23040	460.8	11/10	14.4		
Vegetables	1298	41.5	1298	61.8	1298	73.8
Orchards						
Berries	816	39.8	936	170.7	961	236.7
Nursery, Greenhouse						
Other Crops						
Totals	61151	1222.1	18061	413.h	2259	310.5
Total Herbicides, In	secticide	s, Fungi	cides: 10	00 lbs	81471	1946.0

TABLE 2-MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	6112	653	638	1291
1969	7758	599	675	1274
1972	8500	684	712	1396

Wet Manure Factor: Tons per litter farrowed	7.45
Wet Manure Defecated: Tons, 1972	10400
Nutrients in Wet Manure: Nitrogen, tons	52
Phosphorus, tons	15
Potash, tons	ho

TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	21731 16865	116/1	10090
1969	16865	8644	8221
1972	17800	13986	3814
Wet Manure Per Anima	Factor: Tons	13.14	6.45
Wet Manure Tons, 197		183776	21,600
	Defecated: Tons, 1972 n Wet Manure: Nitrog		76
T. Contraction L		norus, tons 208	
	Potash	i, tons 10h2	

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	5966	
1969	5063	911
1972	2700	5403
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	4347	69050
Nutrients in Wet Manure: Nitrogen, Tons	61,	476
Phosphorus, Tons	9.	69
Potash, Tons	14/4	414

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964	THE PARTY BY THE	106365		To I live
1969		80753		
1972		91251		
Wet Manure Fact	or: Lbs. per bird	82.9		
wet Manure Defe	cated: Tons, 1972	3782		
Nutrients in We	t Manure: Nitrogen, tons	59	Combined	
	Phosphorus, tons	15		
	Potash, tons	13		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 37,6672	Number I-V farms	698
Number of farms	1354	Acres in I-V farms	123391
Acres in farms	161901	Cropland I-V farms	99097
	126202	Harvested cropland	
Harvested cropland in f	arms 84116	I-V farms	72245

	Crop	Tons (	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	1,9238	3551	261	3802
GRAINS	14263	2006	18	2021
Wheat	7940	1182	17	11.99
Oats	5074	674	3	675
Barley	91	17	0	675 17 18
Rye	195	1.8	0	18
OTHER FIELD CROPS	515/15	1134	2	1136
Soybeans	20753	857	2	859
Potatoes	171	247	0	247
Sugar beets				
Field beans	1040	2	0	2
HAY OR GRASS SILAGE	15219	336	1	337
PASTURED CROPLAND	911111 8550	139	0	139
Cropland used for pasture	8550	95	0	95
Improved pasture	894	144	0	bh
VEGETABLES, SWEET CORN, MELONS	1475	1475	3	1478
ORCHARDS	1118	130	0	130
BERRIES	33	4	1	5
NURSERY & GREENHOUSE PRODUCTS	318	153	23	176
OTHER CROPS	15	3	0	3
Total Fertilizer Used, Tons		7933	299	8232
Percent of Fertilizer Used		96	14	100

TABLE 7-FERTILIZER	USED IN 1972
(July 1, 1972-June 30	
Fertilizer Used on Crops: Solid	9026
Liquid	604
Total	9630
Primary Nutrients in Fertilizer	1933
Nitrogen	1318
Phoenharus	18.7

Potash

TABLE 8-GROUND LIMESTONE EQUIVALENT APPLIED

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
1972			9790
Ton	nages for Oth	er Recent Yea	rs
1971			18279
			20200

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	4261	
Total Estima	ted Tons Applied on All Hi	ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Ins	ecticides	Fungicides	Total
Table 1	1222.1		123.4	310.5	1946.0
Manure: K	Ind of	Tons	of Materials	in Wet Manure D	efecated
Livesto	AND THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO I	Manure	Nitrogen	Phosphorus	Potash
Swine: Tab	le 2	1.0400	52	15	40
Cattle: Ta		208376	11.67	208	10/12
Sheep: Tak		4347	61	9	1:1:
Horses: Ta		69050	1476	69	1,71
Chickens:	Table 5	3782	59	15	13
Turkeys: 7		0			
Total from Tor	Livestock,	295955	1815	316	1553
Fertilizer	11	Tons of		rtilizers Applie	d
Ite	aem	Total		Phosphorus	Potash
Applied on Table 7		9030	1318	1647	1968

Lime: Limestone equivalent purchased or applied, tons: Table 8 9790

Salts: Applied on all highways, tons: Table 9 6035

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Ohio

PLANNING SUBAREA: Central 4.3 COUNTY: Medina

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	15741	432.8	3498	52.4		
Grains	7014	35.0	2338	23.3		
Hay or Grass Silage	7590	75.9	6325	63.2		
Pastured Cropland	3535	35.3	3535	35.3		
Other Field Crops	6880	137.6	430	4.3		
Vegetables	68	2.2	68	3.2	68	3.9
Orchards						
Berries	188	11.7	204	34.6	213	45.2
Nursery, Greenhouse						
Other Crops						
					400	
Totals	41016	730.5	16398	216.3	281	19.7
Total Herbicides, In	secticide	s, Fungio	cides: 10	00 1bs	57695	995.9

TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	8383	740	724.	21,64
1969	7881	1:1:6	290	736
1972	8000	366	381	747

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	26522	13619	12903		
1969	21.768	11359	10409		
1972	23700	19089	4611		
Wet Manure Per Anima	Factor: Tons	13.14	6.45		
Wet Manure Tons, 197		250829	29741		
	Defecated: Tons, 197 n Wet Manure: Nitro	ogen, tons	80570 571		
			81 403		

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1456L	
1969	3591	1617
1972	1.800	1412
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2898	56385
Nutrients in Wet Manure: Nitrogen, Tons	11	389
Phosphorus, Tons	6	56
Potash, Tons	29	338

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964 1969 1972	243565 134177		
Wet Manure Factor: Lbs. per bird Wet Manure Defecated: Tons, 1972	151620 82.9 6285		
Nutrients in Wet Manure: Nitrogen, tons	98	Combined	
Phosphorus, tons Potash, tons	25		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	1) 2777hh	Number I-V farms 596
Number of farms	1288	Acres in I-V farms 100815
Acres in farms	11/1/178	Cropland I-V farms 76256
Cropland in farms	702621	Harvested cropland
Harvested cropland in far	ms 611186	I-V farms 53299

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	17655	3275	213	31488
GRAINS	11264	1490	1	1491
Wheat	4806	652	0	652 675 36 9
Oats	5201	675 36 9	.0	675
Barley	279	36	0	36
Rye	79	9	0	9
OTHER FIELD CROPS	4693	358	0	358
Soybeans	4510	315	0	315
Potatoes	41	20	0	20
Sugar beets				
Field beans	493	0	0	0
HAY OR GRASS SILAGE	20029	468	2	1470
PASTURED CROPLAND	11133	195	0	195
Cropland used for pasture	8685	164	0	164
Improved pasture	Slili8	31	0	31
VEGETABLES, SWEET CORN, MELONS	77	17	0	17
ORCHARDS	190		0	
BERRIES	55	16	0	16
NURSERY & GREENHOUSE PRODUCTS	213	168	1	169
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		6009	217	6226
Percent of Fertilizer Used		97	3	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

July 1, 1972-June 30		APPLIED			
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	1,281,	Year	Government Cost/Shared	Government Cost/Shared	
Liquid	3999	1972			
Total	8283		mages for Oth	er Recent Ye	
Primary Nutrients in Fertilizer	4132	1971	mages for our	10000	
Nitrogen	1009	13/3			
Phosphorus	1359				
Potash	1764				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	10489	
Total Estima As Comput	ted Tons Applied on All H	ighways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	s Insecticides		Fungicides	Total	
Table 1	730.5		16.3	49.1	995.9	
Manure: K	ind of	Tons	of Material	ls in Wet Manure	Defecated	
Livesto		Manure	Nitroge	en Phosphorus	Potash	
Swine: Tal		5565	28	8	21	
Cattle: T		280570	1571	281	1403	
Sheep: Tal		2898	41	6	29	
Horses: T		59385	389	59	356	
Chickens:		6285	98	25	22	
Turkeys:		0				
	Livestock,	354703	2127	379	1831	
Fertilizer	s:	Tons of		Fertilizers Appli	.ed	
		Pri		imary Nutrients		
It	em	Total	Nitrogen	Phosphorus	Potasi	
Applied on Table 7	Cropland:	8283	1009	1359	1764	

Lime: Limestone equivalent purchased or applied, tons:
Table 8 9568

Salts: Applied on all highways, tons: Table 9 15213

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2  County, land area, acres includes water areas under 40 acres in size.

Total Tonnage

Lake Erie 4.0 STATE: Ohio COUNTY: Portage PLANNING SUBAREA: Central 4.3

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	14500	398.7	3222	48.3		
Grains	6160	30.8	2053	20.5		
Hay or Grass Silage	5790	57.9	4825	48.2		
Pastured Cropland	2956	29.5	2956	29.5		
Other Field Crops	800	16.0	50	,5		
Vegetables	1048	33.5	1048	49.9	1048	59.6
Orchards	-					
Berries	259	15.0	286	49.9	297	66.6
Nursery, Greenhouse						
Other Crops						
Totals	31513	581.4	11:390	246.8	1345	126.2

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	5152	402	371	773
1969	4162	309	334	643
1972	4100	310	323	633

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

		Number Cattle	
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	20146	9687	10459
1969	17577	8338	9239 6359
1972	19400	13041	6359
Wet Manure   Per Anima	Pactor: Tons	13.14	6.45
Wet Manure 1		171359	41016
Wet Manure 1	Defecated: Tons, 1972	Combined: 21237	
	Wet Manure: Nitrog		
	Phosph	orus, tons 212	
	Potash	, tons 1062	

Year Item	Sheep & Lambs	Horses & Ponies
1964	2969	
1969	2409	1282 1949
1972	1100	1949
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1771	24908
Nutrients in Wet Manure: Nitrogen, Tons	25	172
Phosphorus, Tons	4	25
Potash, Tons	18	149

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964 1969 1972	172525 129805 11,6680		
Wet Manure Factor: Lbs. per bird Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons	82.9 6080 95 24 21	Combined	

TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 316574	Number I-V farms 480
Number of farms	1030	Acres in I-V farms 88214
Acres in farms	124315	Cropland I-V farms 55876
Cropland in farms	76490	Harvested cropland
Harvested cropland in fa	rms 50333	I-V farms 41513

	Crop	Tons o	Tons of Fertilizer Us	
Crops	Acres	Dry	Liquid	Tota
CORN	13505	3020	373	3393
GRAINS	9498	1290	7	1297
Wheat	3228	453	0	153
Oats	5276	721	5	726
Barley	388	53		53
Rye	147	8	1	9
OTHER FIELD CROPS	221/3	1101	2	11.03
Soybeans	610	36	2	38
Potatoes	1633	1066	0	1066
Sugar beets				
Field beans	528	1	0	1
HAY OR GRASS SILAGE	14275	306	1	507
PASTURED CROPLAND	9562	148	0	148
Cropland used for pasture	7494	103	0	103
Improved pasture	2068	45	- 0	115
VEGETABLES, SWEET CORN, MELONS	1191	327	37	364
ORCHARDS	293	21	0	21
BERRIES	293 54	26	0	26
NURSERY & GREENHOUSE PRODUCTS	316	151	0	151
OTHER CROPS	5	0.	0	0
Total Fertilizer Used, Tons		6591	420	7011
Percent of Fertilizer Used		94	6	100

TABLE 7--FERTILIZER USED IN 1972
TABLE 8--GROUND LIMESTONE EQUIVALENT
(July 1, 1972-June 3d, 1973)
APPLIED

COUTY TO TELEGRAPO DA					
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	6999	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1006	1972			8822
Total	8005		nages for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	3719	1971	mages for the		27340
Nitrogen	1089	1.47.10			A deballed
Phosphorus	1318				
Potash	1312				

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	9000	
Total Estimat	ted Tons Applied on All Hi	ghways in 1972-73,

	Herbicide	s In	secticides	Fungicides	Total
Table 1	581.4		246.8	126.2	951.11
fanure: K	ind of			s in Wet Manure D	
Livesto	ck.	Manur		n Phosphorus	
Swine: Tal		4716	24	7	18
Cattle: T		212375	1189	212	1062
Sheep: Ta		2772	25	14	18
Horses: T	able 4	24908	172	25 24	3/19
Chickens:		6080	95	24	21
Turkeys:	Table 5	0			
Total from To	Livestock,	21,9850	1505	272	1268
Fertilizer	s:	Tons of	Commercial F	ertilizers Applie	đ
I DA CALABORA				mary Nutrients	
It	em	Total	Nitrogen	Phosphorus	Potash
	Cropland:	8005	1089	1318	1312
Lime: Lin	estone equiva	lent purch	ased or appli	ed, tons:	

To Convert From Pounds (1b)

Kilograms (kg) Hectare (ha) Kilograms (kg) Acres (acre) Tons (ton)

Multiply By 0.453 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Ohio
PLANNING SUBAREA: Central 4.3 COUNTY: Summit

TABLE 1-ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	1717	17.2	382	5.7		
Grains	1320	6.6	Lilio	11.11		
Hay or Grass Silage	1380	13.8	1150	11.5		
Pastured Cropland	668	6.6	668	6.6		
Other Field Crops	800	16.0	50	.5		
Vegetables	5hh	17.4	Slile	25.9	514	30.9
Orchards						
Berries	176	8.6	201	36.8	207	50.9
Nursery, Greenhouse						
Other Crops						
7.1.2	7764	136.0	31.36	07.16		0.0
Totals Total Herbicides, In	6605	116.2	3435	91.4 00 1bs	751 10791	289.4

TABLE 2-MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1233	100	120	220
1969	566	37	33	70
1972	550	33	35	68

Wet Manure Factor: Tons per litter farrowed 7.45
Wet Manure Defecated: Tons, 1972 507
Nutrients in Wet Manure: Nitrogen, tons 3
Phosphorus, tons 1
Potash, tons 2

TABLE 3-MANURE FROM CATTLE

100		Number Cattle and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves	
1964	1,818	2371	21,1,7	
1969	3/15/1	1708	1786	
1972	3600	2079	1521	
Wet Manure Per Anima	Factor: Tons	13.14	6.45	
Wet Manure Tons, 197		27318	9810	
	Defecated: Tons, 1972 n Wet Manure: Nitroge			
Nutrients 1		rus, tons 37		
	Potash,			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	829	
1969	949	490
1972	900	2320
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	11/19	29650
Nutrients in Wet Manure: Nitrogen, Tons	20	205
Phosphorus, Tons	-3	30
Potash, Tons	14	178

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeye Raised
1964	1,1787		
1969	54381		
1972	61/151		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	2517		
Nutrients in Wet Manure: Nitrogen, tons	40	Combined	
Phosphorus, tons Potash, tons	10		

TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	261120	Number I-V farms 149
Number of farms	315	Acres in I-V farms 18976
Acres in farms	27592	Cropland I-V farms 13250
	18380	Harvested cropland
Harvested cropland in farms	12168	I-V farms 9731

	Crop	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	Tota
CORN	2281	353	17	370
GRAINS	2410	298	0	298
Wheat	1034	138	0	138
Oats	1151	138	0	138
Barley	98	15	0	15
Rye	99 648	2	0	2
OTHER FIELD CROPS		117	4	121
Soybeans	474	34	0	34
Potatoes	129	74	0	74
Sugar beets				
Field beans	101	0	0	0
HAY OR GRASS SILAGE	31,86	15	0	45
PASTURED CROPLAND	2414	26	0	26
Cropland used for pasture	1668	21	0	21
Improved pasture	746	5	0	13
VEGETABLES, SWEET CORN, MELONS	618	139	1	2110
ORCHARDS	240	26	0	26
BERRIES	8	2	0	2
NURSERY & GREENHOUSE PRODUCTS	585	109	2	111
OTHER CROPS	26	0	0	0
Total Fertilizer Used, Tons		1115	24	1139
Percent of Fertilizer Used		98	2	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

TABLE /FERTILIZER	USED IN 1972	IADLE	APPLIED	TESTORS BROXY	TARIMITATE.
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	1115	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	263 1378	1972			2771
Total		Ton	nages for Oth	er Recent Yes	ITS
Primary Nutrients in Fertilizer	579	1971			3732 3169
Nitrogen	185	1973			1 3/109
Phosphorus					
Potash	233 161				

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72 1972-73	91:00	
	timated Tons Applied on All Homputed 13634	ighways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

m-5-5 1	Herbicides		ecticides	Fungicides 81.8	Total 289.4
Table 1					
Manure: Ki Livestoc	_	Tons		in Wet Manure D	Potash
Swine: Tab		507	3	1	2
Cattle: Ta		37128	208	37	186
Sheep: Tab	le 4	1449	20	3	182
Horses: Ta	ble 4	30391	210	30	
Chickens:	Table 5	2547	40	10	9
Turkeys: 1	able 5	0			
Total from Ton		72022	481	81	393
Fertilizers	1	Tons of		ertilizers Applie	d
Ite	m	Total		Phosphorus	Potash
Applied on Table 7		1378	185	233	161

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 13634

# 7.4.2.3 Commercial Fertilizers

The 1972 total of commercial fertilizer use was 38,761 metric tons (42,726 tons) for PSA 4.3. This amount is about 15 percent below the Great Lakes Basin average. Nitrogen represents 28 percent, phosphorus 34, and potash 38 percent of the primary nutrients applied.

### 7.4.2.4 Lime

The amount of lime purchased or applied to croplands in PSA 4.3 was 68,847 metric tons (75,890 tons). Cuyahoga and Ashtabula Counties were heavy users of lime; Loraine, Medina and Portage medium users; and Lake, Geauga and Summit light users. It is projected that lime usage may continue similar to present use.

## 7.4.2.5 Salts

All of the counties in this planning subarea are modest to heavy users of road de-icing salts. The 1972-73 season totalled 123,421 metric tons (136,046 tons) of salts used, the second highest total for the Lake Erie basin and the highest rate per acre. It is projected that these heavy rates will continue.

## 7.5 Planning Subarea 4.4

The five counties in this planning subarea extend from northwest Pennsylvania along Lake Erie and then up to Niagara County which borders Canada and Lake Ontario. While it includes only five counties, these total a larger land area and greater acreage of harvested crops than Planning Subarea 4.3 to the west with eight counties.

## 7.5.1 Agricultural Characteristics

Sweet corn and tomatoes are two of the most important vegetable crops. Potatoes are raised some in the western part of the subarea. The general farm crops -- corn, grains, and hay are raised to support the livestock. The major livestock present are dairy and beef cows.

Table 7-53 indicates relative proportions of materials usage in Planning Subarea 4.4 in comparison with the total Great Lakes Basin.

Table 7-53

MATERIALS USAGE BASIN RELATIONSHIP -- PSA 4.4 TO GREAT LAKES

Per harvested acre of cropland P	lanning Subarea	4.4 G1	reat Lakes Basin
Lbs of chemicals applied	6.	82	2.66
Index of chemicals applied	2	56	100
Tons of livestock manure defecated	5.	47	3.37
Index of Manure defecated	1	.62	100
Lbs primary nutrients in livestock m	the same of the sa	.33	82
Index primary nutrients in manure	who me and 1	.62	100
Lbs commercial fertilizer applied	3	301	321
Percent liquid fertilizer applied		8	22
Index commercial fertilizer applied		94	100
Lbs primary nutrients in commercial	fertilizer 1	16	153
Index primary nutrients in commercial	fertilizer	76	100
Lbs lime applied		333	170
Index lime applied	1	L96	100
Per acre of total land area			
Lbs of road salts used	75.	.86	41.74
Index of road salts used	1	L84	100
To Convert From To		-	iply By
Pounds (1b) Kilogra	ams (kg)		.454
Tons (ton) Kilogra	ams (kg)	907	
Metric	Tons	0	.907

## 7.5.2 Materials Usage

Table 7-54 lists by county the material usage inventory for PSA 4.4. Detailed statistics are shown in Tables 7-55 to 7-60.

Table 7-54
MATERIALS USAGE
(in 1972)

PSA 4.4	Chemicals Applied to Crops (100 lbs)	Livestock Manure (tons)	Commercial Fertilizer on Cropland (tons)	Limestone Purchased or Applied (tons)	Salts Applied to all Highways (tons)
Pennsylvania Erie	6489	421552	16054	15500	59321
New York Cattaraugus Chautaugua Erie Niagara	1610 14560 4382 5237	671634 691731 536237 268866	7910 15398 18317 13653	17791 21491 16157 7849	22481 8992 18855 6933
TOTAL	32278	2590020	71332	78788	116582
To Convert From Pounds (1b) Tons (ton)	<u>om</u>	To Kilograms Kilograms Metric To	(kg)	Multiply B 0.454 907.2 0.907	<u>y</u>

## 7.5.2.1 Agricultural Chemicals

Chemical usage is very heavy as measured in this study. Grape production especially coupled with tree fruit and vegetables account for heavy usage of insecticides and fungicides. Insecticides accounted for 50 percent of all chemicals used — the highest percentage of any subarea in the basin. By contrast, herbicides accounted for only 20 percent of the chemicals used — the lowest of any subarea. Fungicides amounted to 30 percent. Chemical usage is expected to increase in the next 10 years as much as 15 percent. The amount of chemicals applied in 1972 was 1,465,421 kilograms (3,227,800 lbs).

## 7.5.2.2 Animal Wastes

Dairy cows and beef cows along with the replacement of young cattle are the major kinds of livestock and contribute 85 percent of the livestock manure produced. Horses have grown in importance and contribute 13 percent of the manure. The result is an index of manure defecation 62 percent above the total Basin average. This rate may diminish modestly in the decade ahead. In 1972 the level was 2,349,666 metric tons (2,590,020 tons) of wet manure. Nitrogen, phosphorus, and potash combined, comprise 1.2 percent of the total manure tonnage.

## 7.5.2.3 Commercial Fertilizers

During 1972 a total of 64,712 metric tons (71,332 tons) of commercial fertilizer were applied to croplands in PSA 4.4.

Fertilization levels are expected to increase perhaps 10-15 percent, over the next 10 years. They are slightly below Basin average. Nitrogen accounts for 31 percent of the nutrients, phosphorus 37 percent and potash 32 percent. A more intensive use of phosphates appears to be common in the New York counties.

## 7.5.2.4 Lime

Lime usage is substantially higher than Basin average and is expected to continue at these levels. The 1972 level totalled 71,467 metric tons (78,788 tons) of lime either purchased or applied to croplands in this planning subarea.

## 7.5.2.5 Salts

Road de-icers appear to be used liberally also. Road de-icing increases are expected to be associated largely with increases in road mileages as we look ahead. Figures for 1972 show 105,763 metric tons (116,582 tons) of road de-icing salts were applied to all highways in PSA 4.4. This was 21 percent of the salts applied in the Lake Erie basin.

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: Pennsylvania and New York

COUNTY: 5 County Totals PLANNING SUBAREA: East 4.4

#### TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	ticides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	94230	2591.1	20940	314.1		
Grains	31368	156.6		104.4		DE DA
Hay or Grass Silage	77915	778.9	64929	649.0		
Pastured Cropland	37448	374.3	37448	374.3		-
Other Field Crops	4011	113.9	3791	431.9	3752	562.9
Vegetables	25346	834+2	25346	1027.1	25346	1105.1
Orchards						
Berries	31:800	1544.7	40183	13196.7	42723	8118.8
Nursery, Greenhouse		No. of Concession, Name of Street, or other party of the Concession, Name of Street, or other pa				
Other Crops						
Totals	305118	6393.7	203094	16097.5	71821	9786.8
Total Herbicides, In				00 1bs	580033	32278.0

#### TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	20590	15117	1534	3081
1969	11,796	1245	1.053	2298
1972	11:363	1167	1061	2228

Wet Manure Factor: Tons per litter farrowed\_ Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons\_ Phosphorus, tons\_ 23 Potash, tons\_

## MANTE 2 MANIEUR PROM CATTLE

	BURELL IN	Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	236650	138855	97795			
1969	212277	119662	92615			
1972	214947	120879	94068			
Wet Manure Per Anima	Factor: Tons	13.14	6,45			
Wet Manure Tons, 197		1588350	606739			
	Defecated: Tons, 1972 n Wet Manure: Nitroge Phospho Potash,	en, tons 1	195089 2 <b>2</b> 93 196 0975			

## TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	11397	
1969	10112	6974
1972	9523	25922
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	15332	331283
Nutrients in Wet Manure: Nitrogen, Tons	215	2286
Phosphorus, Tons	-32	331 1988
Potash, Tons	153	1988

## TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		979335		
1969		758361		
1972		682277	6250	62500
Wet Manure Factor	: Lbs. per bird	82.9	365.0	89.63
Wet Manure Defeca	ted: Tons, 1972	28280		
Nutrients in Wet	Manure:		Combined	3928
	Nitrogen, tons	1411		51
	Phosphorus, tons	113		6
	Potash, tons	99		11

### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres(1)	3073280	Number I-V farms	5479
Number of farms	8934	Acres in I-V farms	979578
Acres in farms	1229838	Cropland I-V farms	611589
Cropland in farms	741179	Harvested cropland	
Harvested cropland in farms	1473598	I-V farms	117103

	Crop	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total	
CORN	71158	14031	1279	15310	
GRAINS	52492	6683	55	6738	
Wheat	12325	1743	29	1772	
Oats	33707 1080	4583 136	13	4596	
Barley	1.080	136	2	138	
Rye	1250	84	1	85	
OTHER FIELD CROPS	5737 386	2788	35	2823	
Soybeans	386	14	0	114	
Potatoes	4168	2542	34	2576	
Sugar beets				1	
Field beans	987	3	0	3	
HAY OR GRASS SILAGE	211990	3547	135	3682	
PASTURED CROPLAND	150047	1359	33	1392	
Cropland used for pasture	116944	989	31	1020	
Improved pasture	33103	370 75144	2	372	
VEGETABLES, SWEET CORN, MELONS	29337	7514	207	7751	
ORCHARDS	14693	6094 166	80L	6898	
BERRIES	14693 834	166	2	168	
NURSERY & GREENHOUSE PRODUCTS	3365	331	36	367	
OTHER CROPS	206	24	0	5/1	
Total Fertilizer Used, Tons		42570	2586	15156	
Percent of Fertilizer Used	1 1 1 1 1 1	94	6	100	

TABLE 7FERTILIZER U	SED IN 1972	TABLE	8
Item	Tons		
Fertilizer Used on Crops: Solid	65696	Year	G
Liquid	5636	1972	
Total	71332	Tor	nn
Primary Nutrients in Fertilizer	27453	100	
Nitrogen	8401	-	_
Phosphorus	10102		
Potash	8950		

## CROUND I THESTONE POUTVALENT

Year	Tonnage Government Cost/Shared	Tonnage not Government Cost/Shared	Total Tonnage
1972			78788
Ton	mages for Oth	er Recent Yea	rs

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		market how at
1971-72		
1972-73	80380	NOT THE HELD
Total Estimat	ted Tons Applied on All Hi	ighways in 1972-73,

## TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

He	rbicides	Insed	cticides	Fungicides	Total
Table 1 63	193.7	1609	7.5	9786.8	32278.0
Manure: Kind of		Tons o	of Materials	in Wet Manure	Defecated
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2		6108	81	23	61
Cattle: Table 3	3 2	195089	12293	2196	10975
Sheep: Table 4	1	5332	215	32	153
Horses: Table 4		31283	2286	331	1,988
Chickens: Table		8280	141	113	99
Turkeys: Table		928	61	16	7/1
Total from Lives Tons	stock, 2	590020	15377	2711	13290
Fertilizers:		Tons of C		rtilizers Appli	ed
			Prim	ary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potasi
Applied on Crop	Land: 71	332	8401	10102	8950

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 116582

PLANNING AREA: Lake Erie 4.0 STATE: Pennsylvania PLANNING SUBAREA; East L.L. COUNTY: Erie

	Herbi	cides	Insect	cicides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	18450	507.3	4100	61.5		
Grains	6900	34.5	2300	23.0		
Hay or Grass Silage	14670	146.7	12225	122.2		
Pastured Cropland	6535	65.3	6535	65.3		
Other Field Crops	2748	81.6	2969	340.9	2964	444.6
Vegetables	2501	64.4	2501	150.3	2501	87.7
Orchards					2	100
Berries	8685	403.4	10168	1650.1	10302	2240.3
Nursery, Greenhouse						
Other Crops						
Totals	60489	1303.2	40798	2413.3	15767	2772.6
Total Herbicides, In	secticide	s, Fungio	ides: 10	00 lbs	11.7054	6489.1

TABLE 2--MANURE FROM SWINE

	Mumber 50	vs Farrowing	
Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
2998	202	207	409
2439	1147	178	409 325
2500	163	170	333
	Dec. 1 2998 2439	Dec. 1 Spring 2998 202 2439 147	Dec. 1         Spring         Fall           2998         202         207           2439         117         178

TABLE 3-MANUER FROM CATTLE

Year	Total	Cows & Heifers Calved	
		OUTVEG	Bulls, Calves
	1669	23379 19220	18290 15775
	1995	17h2h	19176
Wet Manure Factor Per Animal	: Tons	13.14	6,45
Wet Manure Defeca Tons, 1972	ted:	228951	125620

Year Item	Sheep & Lambs	Horses & Ponies
1964	1528	
1969	929	1169
1972	800	14154
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1288	56922
Nutrients in Wet Manure: Nitrogen, Tons	18	393 57
Phosphorus, Tons	3	57
Potash, Tons	13	342

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	168365		
1969	93983		
1972	77700	5000	50000
Wet Manure Factor: Lbs. per bird	82.9 3221	365.0	89.63
Wet Manure Defecated: Tons, 1972	3221		
Nutrients in Wet Manure: Nitrogen, tons	50	Combined	3142 49
Phosphorus, tons	13		13
Potash, tons	27		11

COUNTY, land area, acre	s (1) 520064	Number I-V farms 1097
Number of farms	1733	Acres in I-V farms 171176
Acres in farms	217866	Cropland I-V farms 106077
Cropland in farms	129182	Harvested cropland
Harvested cropland in	farms 85173	I-V farms 74806

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	13512	2953	1.08	3061
GRAINS	11711	1741	7	1748
Wheat	2018	283	2	285
Oats	9156	1382	3	1385
Barley	299 182	143	2	145
Rye		21		
OTHER FIELD CROPS	3266	1668	35	1703
Soybeans	80	7	0	7
Potatoes	3138	1656	34	1690
Sugar beets				
Field beans	145	0	0	0
HAY OR GRASS SILAGE	30023	632	6	638
PASTURED CROPLAND	25878	399	9	408
Cropland used for pasture	19971	295	8	303
Improved pasture	5907	104	1	105
VEGETABLES, SWEET CORN, MELONS	3308	992	11/1	1006
ORCHARDS	12442	1939	198	2137
BERRIES	2.00	26	0	26
NURSERY & GREENHOUSE PRODUCTS	818	40	0	40
OTHER CROPS	1.7	2	0	3
Total Fertilizer Used, Tons		10392	377	10769
Percent of Fertilizer Used		96	4	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED	-	
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	11,288	Year	Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1766	1972			15500
Total	16054		nagge for Oth	er Recent Yes	
Primary Nutrients in Fertilizer	5894	101	nages for our	C. INCOME TO	
Nitrogen	1717				
Phosphorus	2125				
Describ	2052				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Tons Purchased Through State	Tons Applied Per "E" Mile
	Electronic and a second
34779	
140900	
	Through State

Swine: Table 2 2408 12 3 9 Cattle: Table 3 354571 1986 355 17 Sheep: Table 4 1288 18 3 13 Horses: Table 4 56922 393 57 35 Chickens: Table 5 3221 50 13 11 Turkeys: Table 5 3142 49 13 11 Total from Livestock, Tons 421552 2508 444 21	Herbicid Table 1 1303.2		ecticides	Fungicides 2772.6	Total 6489.1
Swine: Table 2     2408     12     3     9       Cattle: Table 3     35571     1986     355     17       Sheep: Table 4     1288     18     3     13       Horses: Table 4     56922     393     57     35       Chickens: Table 5     3221     50     13     11       Turkeys: Table 5     3112     19     13     11       Total from Livestock, Tons     121552     2508     1141     21					Potash
Cattle: Table 3 351571 1986 355 17 Sheep: Table 4 1288 18 3 13 Horses: Table 4 56922 393 57 35 Chickens: Table 5 3221 50 13 11 Turkeys: Table 5 3112 19 13 11 Total from Livestock, Tons 121552 2508 111 21				3	9
Sheep: Table 4   1288   18   3   13			1986	355	1773
Horses: Table 4 56922 393 57 32. Chickens: Table 5 3221 50 13 11 Turkeys: Table 5 3112 19 13 11 Total from Livestock, Tons 421552 2508 4114 21		1288		3	
Turkeys: Table 5 31h2 h9 13 11 Total from Livestock, L21552 2508 hhh 21		56922	393		351
Turkeys: Table 5 31h2 h9 13 11 Total from Livestock, L21552 2508 hhh 21		3221	50	13	
Total from Livestock, h21552 2508 hhh 21		SILE		1.3	11
Fortilizers: Tons of Commercial Fertilizers Applied	Total from Livestock,	421552	2508	lilili	2168
	Fertilizers:	Tons of			d
Primary Nutrients  Item Total Nitrogen Phosphorus Pot	Item	Total			Potash
Applied on Cropland: 16054 1717 2125 20		16054	1717	2125	2052

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 .4047 907.2

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

STATE: New York Lake Erie 4.0 PLANNING AREA: COUNTY: Cattaraugus PLANNING SUBAREA: East 4.4

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	16200	445.5	3600	54.0		
Grains	3911	19.5	1305	13.0		
Hay or Grass Silage	19858	198.5	16548	165.4		
Pastured Cropland	10781	107.8	10781	107.8		
Other Field Crops	112	2.2	13	45.2	6	52.5
Vegetables	1178	39.7	1178	45.2	1178	52.5
Orchards						
Berries	496	25.7	538	232.9	595	98.4
Nursery, Greenhouse						
Other Crops						
Totals	52539	838.9	33963	619.0	1779 88281	151.8 1609.7

	Hog & Pig	Number Son	ws Farrowing	
dear .	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	1683	190	176	366
1969	1113	182	169	351
1972	1356	179	158	337

Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	60160	37812	22648
1969	55673	32575	23098
1972	57743	33552	24191
Wet Manure   Per Anima	Factor: Tons	13.14	6.45
Wet Manure 1		Щ-0873	156032
	Defecated: Tons, 19	772 Combined: 59	6905
nucradite 1		sphorus, tons 59	
		ash, tons 29	

Year Item	Sheep & Lambs	Horses & Ponies
1964	1077	
1969	1077	1378
1972	1326	5250
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2135	67095
Nutrients in Wet Manure: Nitrogen, Tons	30	463
Phosphorus, Tons	14	67
Potash. Tons	21	403

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	139955		
1969	81189		
1972	73882		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	3062		
Nutrients in Wet Manure: Nitrogen, tons	48	Combined	
Phosphorus, tons	12		
Potash, tons	11		-

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres_	(1) 81.3520	Number I-V farms	999
Number of farms	11/75	Acres in I-V farms	2112220
Acres in farms	295583	Cropland I-V farms	124286
Cropland in farms	11,5920	Harvested cropland	
Harvested cropland in far	ms 88298	I-V farms	79998

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	12510	21,63	74	2537
GRAINS	6524	856 56	2	858 56
Wheat	374	56	0	56
Oats	5882	780	0	780
Barley	80	11	0	111
Rye	70	0	0	0
OTHER FIELD CROPS	93 84	6	0	6
Soybeans	84	14	0	14
Potatoes	9	2	0.	2
Sugar beets				
Field beans	260	0	0	0
HAY OR GRASS SILAGE	58938 48011	737	27	764
PASTURED CROPLAND	48011	300	1	301
Cropland used for pasture	34710	198	1	199
Improved pasture	13301	102	0	1.02
VEGETABLES, SWEET CORN, MELONS	1343	3l <sub>1</sub> 3 1 <sub>4</sub> 8	0	343
ORCHARDS	412	48	5	53
BERRIES	76	17	0	17
NURSERY & GREENHOUSE PRODUCTS	106	5	20	25
OTHER CROPS	25	2	0	2
Total Fertilizer Used, Tons		14777	129	1,906
Percent of Fertilizer Used		97	3	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

			APPLIED			
Item	Tons		Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	7356	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	554	1972			17791	
Total	7910	Tonnages for Other Recent Year				
Primary Nutrients in Fertilizer	3085	101	nages see ver			
Nitrogen	956					
Phosphorus	111/2					
Potash	987					

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	15500	

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Herbicide	s Inse	cticides	Fungicides	Total
Table 1 838.9		9.0	151.8	1609.7
Manure: Kind of	Tons	of Materials	in Wet Manure D	efecated
Livestock	Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2	2437	12	3	9
Cattle: Table 3	596905	3343	597	2985
Sheep: Table 4	2135	30	4	21
Horses: Table 4	67095	463	67	403
Chickens: Table 5	3062	148	12	11
Turkeys: Table 5	0	0	0	0
Total from Livestock, Tons	671634	3896	683	31429
Fertilizers:	Tons of		rtilizers Applie	d
		Prim	ary Nutrients	
Item	Total	Nitrogen	Phosphorus	Potasi
Applied on Cropland: Table 7	7910	956	11/12	987

Lime: Limestone equivalent purchased or applied, tons: Table 8 17791

Salts: Applied on all highways, tons: Table 9 22481

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047

Lake Erie 4.0 STATE: New York PLANNING SUBAREA: East 4.4 COUNTY: Chautaugua

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972	

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	19800	514.5	1100	66.0		
Grains	3485	17.4	1162	11.6		
Hay or Grass Silage	19570	195.7	16308	163.0		
Pastured Cropland	10775	107.7	10775	107.7		
Other Field Crops	351	8.6	182	19.7	170	25.5
Vegetables	5158	173.8	5158	198.0	5158	229.7
Orchards						
Berries	15649	642.7	17580	8661.5	19476	3387.0
Nursery, Greenhouse		1 3 3				
Other Crops						
Totals	71,788	1690.h	55565	9227.5	21,804	3642.2

#### TABLE 2--MANURE FROM SWINE

30 Total
239
203
195

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	67883	39189	28694			
1969	59151	33168 34163	25983			
1972	58795	34163	24632			
Wet Manure Per Anima		13.24	6.45			
Wet Manure Tons, 197		1418902	158876			

## TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1750	
1969	1750 1224	1760
1972	1163	6000
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1872	7,6680
Nutrients in Wet Manure: Nitrogen, Tons	26	529
Phosphorus, Tons	4	77
Potash, Tons	19	460

## TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	215115		
1969	105769		
1972	96250		
Wet Manure Factor: Lbs. per bi	rd 82.9		
met Manure Defecated: Tons, 19	72 3990		
Nutrients in Wet Manure: Nitrogen, tons		Combined	
Phosphorus, to Potash, tons		-	-

#### TARLE 6 \_\_ COOP ACREACES & BERTHI 17PD HEED \_ PLACE T. W PENCHE DADME 1060

COUNTY, land area, acres (1)	697.58)	Number I-V farms 1669
Number of farms	2392	Acres in I-V farms 272106
Acres in farms	322237	Cropland I-V farms 153768
Cropland in farms	174736	Harvested cropland
Harvested cropland in farms	110718	I-V farms 101483

	Crop	Tons of Fertilizer Used		
Crops	Acres	Dry	Liquid	Tota
CORN	15103	2675	368	3043
GRAINS	5809	765	4	769 68 614
Wheat	578	68	0	68
Oats	4721	640	4	644
Barley	54	9	0	9
Rye	276	35	0	35
OTHER FIELD CROPS	363	152	0	152
Soybeans	155	0	0	0
Potatoes	208	152	0	152
Sugar beets				10000
Field beans	83	3	0	3
HAY OR GRASS SILAGE	58220	969	56	1025
PASTURED CROPLAND	46131	394	23	117
Cropland used for pasture	36313	282	22	304
Improved pasture	9818	112	1	113
VEGETABLES, SWEET CORN, MELONS	5993	1480	511	1491
ORCHARDS	16435	2086	541	2627
BERRIES	222	33	2	35
NURSERY & GREENHOUSE PRODUCTS	84	18	7	25
OTHER CROPS	39		0	
Total Fertilizer Used, Tons		8581	1012	9593
Percent of Fertilizer Used		89	11	100

ABLE 7FERTILIZER	USED IN 1972	TABLE 8GROUND LIMESTONE EQUIVALENT APPLIED			
Item	Tons		Tonnage	Tonnage not	
ertilizer Used on Crops: Solid	11,320	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1078	1972			21491
Cotal	15398	Tonnages for Other Recent Years			
Primary Nutrients in Fertilizer	6005	101	liages for oth	The second real	
litrogen	1862				
hosphorus	2222				
Potash	7 9 9 7				

## TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		and the second second
1971-72		
1972-73	6200	
Total Esti	mated Tons Applied on All High	hways in 1972-73,

## TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides		secticides 227.5	Fungicides 3642.2	Total
	ind of	Ton	s of Material	s in Wet Manure	Defecated
Livestock		Manur	e Nitroge	en Phosphorus	Potash
Swine: Tab	le 2	11/10	7	2	5
Cattle: Ta		607778	3404	608	3039
Sheep: Tab		1872	26	4	19
Horses: Table 4		76680	529	77	460
Chickens: Table 5		3990	62	1.6	74
Turkeys: T		0	0	0	0
Total from	tal from Livestock, Tons		1,028	707	3537
Fertilizers	31	Tons of		Pertilizers Appli	ed
		Primary Nutrients			
Ite	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	15398	1862	2222	1921
	estone equiva Le 8 211		ased or appli	led, tons:	

### To Convert From

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Erie 4.0 STATE: New York PLANNING SUBAREA: East 4.4 \_\_ COUNTY: Erie

8.02	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	17730	487.5	3940	59.1 26.7		
Grains	8016	40.0	2672	26.7		
Hay or Grass Silage	11,869	148.6	12391	123.9		
Pastured Cropland	5711	57.1	5711	57.1		
Other Field Crops	577	15.7	469	52.9	459	68.9
Vegetables	13985	471.2	13985	536.7	13985	622.8
Orchards						
Berries	2212	114.7	2389	1.066.9	2655	431.8
Nursery, Greenhouse	2020100					
Other Crops						
Totals	63100	1331.8	h1557	1923.3	17099	1123.5

TABIF 2 MANITON PROM CUTNE

	Hog & Pig	Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	9668	51,5	584	1129
1969	4007	276	253	529
1972	3847	269	239	508

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

		Number Cattle and Calves					
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	131.97	26674	16523				
1969	39373	23842	15531				
1972	142263	24557	17706				
Wet Manure   Per Anima	Factor: Tons	13.14	6.45				
Wet Manure 1 Tons, 197		322679	11/150/1				
	Defecated: Tons, 1972						
Nutrients in	n Wet Manure: Nitroger	rus, tons 244					
	Potash,						

TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2882	
1969	2651	1560
1972	2518	6000
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	4054	76680
Nutrients in Wet Manure: Nitrogen, Tons	57	529
Phosphorus, Tons	9	77
Potash, Tons	41	1,60

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey	Turkeys Raised
1964		318545		
1969				
1972		376313 342445	1200	12000
	or: Lbs. per bird	82.9	365.0	89.63
	cated: Tons, 1972	14194	1223	- W. 1502
Nutrients in Wet	Nitrogen, tons	221	Combined 7	54
	Phosphorus, tons Potash, tons	57	-3	
	rotasn, tons	50	3	

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	677376	Number I-V farms 983
Number of farms	1680	Acres in I-V farms 173962
Acres in farms	222215	Cropland I-V farms 124938
Cropland in farms	151082	Harvested cropland
Harvested cropland in f	arms 103363	I-V farms 91129

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	15147	3312	187	31199
GRAINS	13360	1510	4	1514
Wheat	2572	374	0	374
Oats	7898	1045	4	1049
Barley	516	55	0	55
Rye	623	10	0	
OTHER FIELD CROPS	1051	630	0	630
Soybeans	62	2	0	2 554
Potatoes	614	554	0	554
Sugar beets				
Field beans	167	0	0	0
HAY OR GRASS SILAGE	41289	810	1	811
PASTURED CROPLAND	20755	220	0	220
Cropland used for pasture	17495	173	0	173
Improved pasture	3260	47	0	147
VEGETABLES, SWEET CORN, MELONS	16161	3884	154	4038
ORCHARDS	2289	328 86	18	3l <sub>4</sub> 6 86
BERRIES	400		0	86
NURSERY & GREENHOUSE PRODUCTS	2211	255	8	263
OTHER CROPS	46	10	0	10
Total Fertilizer Used, Tons		11045	372	11417
Percant of Fertilizer Used		97	3	100

TABLE 7FERTILIZER USED IN 1972		TABLE	APPLIED	MESTONE EQUIV	ALENI
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	17035	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1282	1972			16157
Total	18317		mages for Oth	on Pasant Van	
Primary Nutrients in Fertilizer	711/4	101	inages for oth	er Recent rea	Lo
Nitrogen	2215				
Phosphorus	2643				
Potash	2286				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	13000	
Total Estima As Comput	ted Tons Applied on All Hi	Ighways in 1972-73,

Table 1	Herbicides	Insecticides 1923.3		Fungicides	Total 4381.6		
Manure: Kind of		Manure		in Wet Manure Defecated Phosphorus Potas			
Livestock Swine: Table 2		3672	18	Ziiospiiotus	7/1		
Cattle: Table 3		436883	2hli7	137	2184		
Sheep: Table 4		4054	57	9	41		
Horses: Table 4		76680	529	77	460		
Chickens: T			221	57	50		
Turkeys: Tal		754	12	3	3		
Total from L. Tons	otal from Livestock, Tons		3284	588	2752		
Fertilizers:		Tons of	Commercial Fer	tilizers Applie	d		
			Prima	ry Nutrients			
Item		Total	Nitrogen	Phosphorus	Potash		
Applied on C Table 7	ropland:	18317	2215	2643	2286		

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 18855

Agricultural Chemicals	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
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PLANNING AREA: Lake Erie 4.0 STATE: New York PLANNING SUBAREA: East 4.4 COUNTY: Niagara

TARLE 1 PETIMATED AMOUNTS OF CUENTCALS HERD ON CROPS 1072

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	22050	606.3	11900	73.5		
Grains	9053	45.2	3018	30.1		
Hay or Grass Silage	8948	89.4	7457	74.5		
Pastured Cropland	3646	36.4	3646	36.4		
Other Field Crops	223	5.8	158	17.7	153	23.0
Vegetables	2524	85.1	2524	96.9	2524	112.4
Orchards						
Berries	7758	358.2	9508	1585.3	9695	1961.3
Nursery, Greenhouse						
Other Crops						
Totals	5h202	1226.h	31211	1914.4	12372	2096.7
Total Herbicides, In				00 1bs	97785	5237.

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	lili62	489	1/1/9	938
1969	5176	507	383	
1972	4969	507 453	383 402	890 855
	re Factor: T	ons per litter fa	arrowed 7.23 6182	
Nutrient	s in Wet Manu	re: Nitrogen, to	ons 31	
		Phosphorus,	tons 9	
		Potash, ton	s 23	

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	231/11	11.801	11640			
1969	23085	10857	12228			
1972	19246	11183	8063			
Wet Manure H Per Animal	actor: Tons	13.14	6.45			
Wet Manure I Tons, 1972		146945	52006			
	efecated: Tons, 197					
	Phosp	horus, tons 199				

# TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	4160	
1969	3912	1107
1972	3716	4218
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	5983	53906
Nutrients in Wet Manure: Nitrogen, Tons	84	372
Phosphorus, Tons	13	54
Potash, Tons	60	323

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	137355		
1969	101107		
1972	92000	50	500
Wet Manure Factor: Lbs. per bird Wet Manure Defecated: Tons, 1972	82.9 3813	365.0	89.63
Nutrients in Wet Manure:  Nitrogen, tons Phosphorus, tons Potash, tons	59 15 13	Combined	31 0 0

TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	340736	Number I-V farms 731
Number of farms	1654	Acres in I-V farms 119814
Acres in farms	171937	Cropland I-V farms 102520
Cropland in farms	140259	Harvested cropland
Harvested cropland in f.	arms 86046	I-V farms 69687

	Crop	Tons (	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	14586	2628	5/12	3170
GRAINS	15088	1811	38	1849
Wheat	6783	962	27	989
Oats	6050	736	. 2	738
Barley	131	18	0	738
Rye	99	18	1	19
OTHER FIELD CROPS	964	332	0	332
Soybeans	5	1	0	1
Potatoes	199	178	0	178
Sugar beets				
Field beans	1:32	0	0	0
HAY OR GRASS SILAGE	23520	399	45	Julile
PASTURED CROPLAND	9272 8455	46	0	46
Cropland used for pasture	8455	41	0	111
Improved pasture	817	5	0	5
VEGETABLES, SWEET CORN, MELONS	2532	845	28	873
ORCHARDS	13115	1693	715	1735
BERRIES	36	14	0	1
NURSERY & GREENHOUSE PRODUCTS	146	13	1	111
OTHER CROPS	79	14	0	14
Total Fertilizer Used, Tons		7775	696	8472
Percent of Fertilizer Used		92	8	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED			
Item	Tons		Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	12697	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	956	1972			78119	
Total 13653		Tonnages for Other Recent Years				
Primary Nutrients in Fertilizer	5325	100	nages 101 Ott	er wedent rea	1.0	
Nitrogen	1651					
Phosphorus	1970					
Potash	1704					

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	4780	
	timated Tons Applied on All Hig mputed 6933	hways in 1972-73,

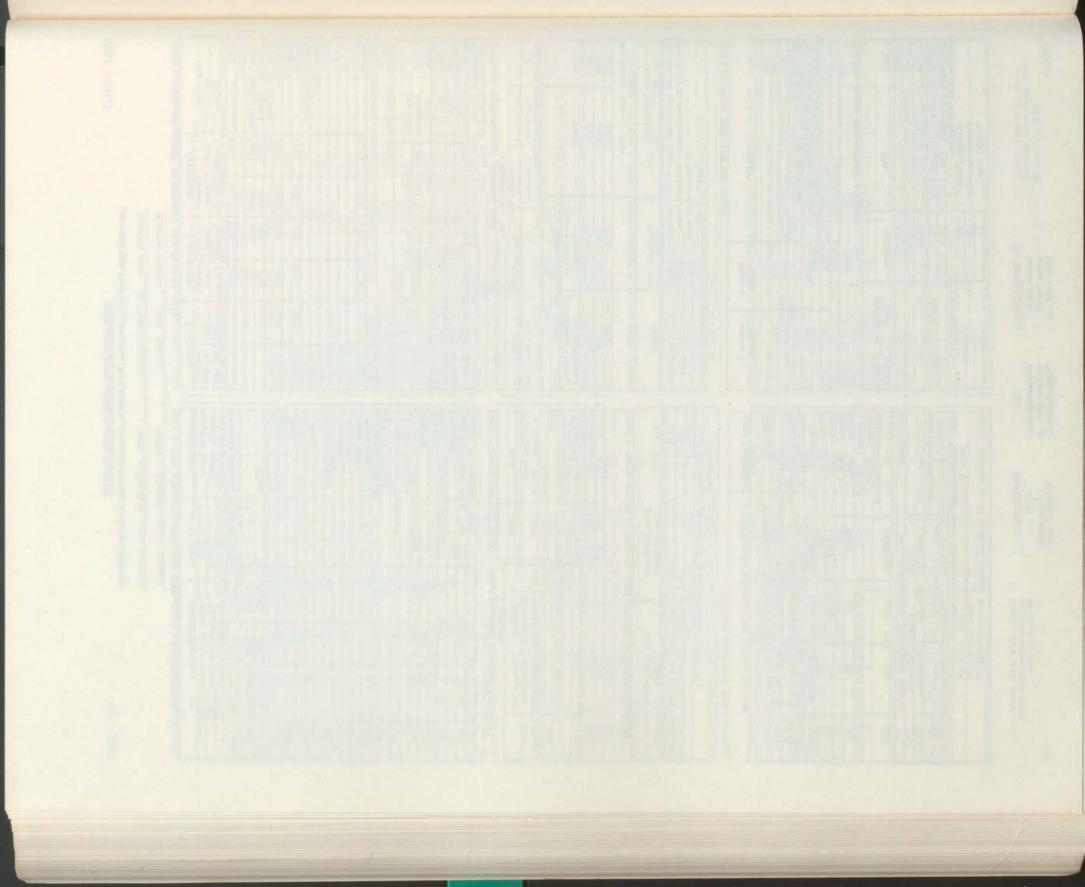
Herbicio		s In	secticides	Fungicides	Total
Table 1	1226.4		914.4	2096.7	5237.5
Manure: Kind of		Ton	s of Materials	in Wet Manure D	efecated
Livesto		Manur	e Nitrogen	Phosphorus	Potast
Swine: Tab		6182	31	9	23
Cattle: Table 3		198951	1114	199	995
Sheep: Table 4		5983	84	13	60
Horses: Table 4		53906	372	514	323
Chickens: Table 5		3813	59	15	13
Turkeys: Table 5		31	0	0	0
Total from Livestock, Tons		268866	1660	290	1/11/1
Fertilizer	9:	Tons of	Commercial Fe	rtilizers Applie	d
			Priu	ary Nutrients	
Ite	em	Total	Nitrogen	Phosphorus	Potasi
Applied on Table 7	Cropland:	13653	1651	1970	1704

Table 8 7849

Salts: Applied on all highways, tons: Table 9 6933

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2



# MATERIALS USAGE IN THE LAKE ONTARIO BASIN

### 8.1 Basin Characteristics

This area encompasses 21 New York counties, 6 in the western part of the state (Planning Subarea 5.1), 12 in the central part (Planning Subarea 5.2), and 3 counties in the northern part (Planning Subarea 5.3).

# 8.1.1 Agricultural Characteristics

This Lake basin has several areas producing fruit and vegetable products. Other crops grown are corn, grains, and hay which primarily support the livestock. Dairying is the major livestock enterprise in all three subareas.

Table 8-1 indicates the relative proportions of materials usage in the Lake Ontario basin as compared to the total U.S. Great Lakes Basin.

Table 8-1

MATERIALS USAGE BASIN RELATIONSHIP -- LAKE ONATRIO 5.0 to GREAT LAKES

Per harvested acre of cropland	Lake Ontario basi	n Great Lakes Basin
Lbs of chemicals applied	3.05	2.66
Index of chemicals applied	115	100
Tons livestock manure defecated	4.77	3.37
Index of manure defecated	142	100
Lbs primary nutrients in livestock manure	116	82
Index primary nutrients in manure	141	100
Lbs commercial fertilizer applied	309	321
Percent liquid fertilizer applied	7	22
Index commercial fertilizer applied	96	100
Lbs primary nutrients in commercial ferti	lizer 120	153
Index primary nutrients in commercial fert:	ilizer 78	100
Lbs of lime applied	198	170
Inde of lime applied	116	100
Per acre of total land area		
Lbs road salts used	59.77	41.74
Index road salts used	143	100
To Convert From To	THE RESERVE	Multiply By
Pounds (1b) Kilogram	s (kg)	0.454
Tourids (ID)		907.2
Tons (ton) Kilograms Metric To		0.907

# 8.1.2 Materials Usage

An inventory and analysis of materials usage was made based on personal interviews, correspondence and statistics as available from agricultural statistics, census information, state highway departments, universities, private companies, and state and federal agencies. Background for the analysis is presented in the Methodology Section. Table 8-2 summarizes the findings of this inventory and analysis. Detailed statistics are shown in Table 8-3.

Table 8-2 MATERIALS USAGE (in 1972)

Area	Chemicals Applied to Crops (100 lbs)	Livestock Manure (tons)	Commercial Fertilizer on Cropland (tons)	Limestone Purchased or Applied (tons)	Salts Applied to All Highways (tons)
Lake Ontari basin PSA 5.1 PSA 5.2 PSA 5.3	0 - 60,021 - 17,690 37,428 - 4,903	9,397,934 2,241,728 4,566,593 2,589,613	304,073 108,277 168,436 27,360	195,173 66,825 93,608 34,740	339,016 185,592 123,561 29,863
To Conver Pounds Tons (t	(1b)	<u>To</u> Kilogra Kilogra Metric	ams (kg)	Multiply By 0.454 907.2 0.907	

# 8.1.2.1 Agricultural Chemicals

Chemical usage is modest in Planning Subarea 5.1, heavy in Planning Subarea 5.2 and light in Planning Subarea 5.3. The chemical usage combines to give a higher than average figure for the area. With the large acreages of fruit and vegetable crops produced, it is projected that there will be increased use of chemicals rather than a decrease or continuance at present levels. There are so many indefinite factors in the chemical field and so many new developments occurring that there are likely to be great changes. An increase in the use of chemicals perhaps as much as 15-20 percent is estimated. Many scientists feel that the likelihood for increased use of herbicides is the greatest, with fungicide use perhaps increasing modestly.

One of the problems concerning the use of chemicals, even if effective in performing their functional roles is that some residues will still remain in the soils. In the case of herbicides, this is known as "carryover" and in the case of insecticides as "persistence". It is believed that the persistence associated with insecticides will be almost entirely eliminated in the future and that carryover in herbicides will be greatly reduced, if not entirely eliminated.

# 8.1.2.2 Animal Wastes

Dairying is the major livestock enterprise in all three planning subareas. The cows and supporting young cattle produced 88 percent of the livestock manure; horses produced 9 percent while chickens, swine and sheep each produced 1 percent. The manure index was above the Great Lakes Basin average in each of the three subareas. Overall livestock numbers may decrease slightly. Horse numbers may increase but not at recent rates. Manure production may stay about the same or decline slightly, but will continue well above the Basin average for the next 10 years. The 1972 levels were 8,525,800 metric tons (9,397,934 tons) of wet manure produced in the Lake Ontario basin. Nitrogen, phosphorus and potash comprise 1.2 percent of the total manure defecated.

# 8.1.2.3 Commercial Fertilizers

It is not uncommon for chemical use and fertilizer use to accompany each other. Good farmers use both if needed. In this area nitrogen represented 32 percent of the fertilizer nutrients applied, phosphorus 32 percent and potash 36 percent. This ratio is likely to continue, although it is possible that nitrogen may show a little greater increase, potash second and phosphorus the least. Fertilization rates are likely to increase by at least 15 percent in the next 10 years. A total of 275,855 metric tons (304,073 tons) of commercial fertilizers were applied to crops in the Lake Ontario basin in 1972.

# 8.1.2.4 Lime

A total of 177,060 metric tons (195,173 tons) of limestone was used in the Lake Ontario basin in 1972. Lime is important in terms of its water quality impacts due to its effects on the pH level of water and subsequent effects on water's acid-base relationships. The possibility of precipatating phosphorus in the water and altering calcium content is also likely.

# 8.1.2.5 Salts

Road de-icing salts are intensively used in this lake basin, heaviest in PSA 5.1, modest in PSA 5.2, but surprisingly light in PSA 5.3. The severe climatic conditions during winter and resultant heavy snowfalls require using the salts to keep major roadways open. The 1972-73 figures show that 307,555 metric tons (339,016 tons) of road de-icing salts were used in highways in this lake basin. It is projected that this rate will continue to be high for the Lake Ontario area. The primary impact upon ground and surface waters resulting from road de-icing salts comes from chloride discharges which can over time affect the salinity of nearby wells and open water areas. Assuming that chlorides are conservation and that ion exchange between chlorides and various soil types are minimal, most of the chlorides will eventually reach ground and surface water areas.

GREAT LAKES BASIN MATERIAL USAGE INVENTORY Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Ontario 5.0 STATE: New York

West 5.1,
PLANNING SUBAREA: Central 5.2, East 5.3 COUNTY: 21 County Totals (New York-21) STATE: New York

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	458640	12612.0	101920	1528.8		
Grains	190725	952.9	63576	634.9		
Hay or Grass Silage	298334	2982.2	248613	2485.3		
Pastured Cropland	166499	1663.9	166499	1663.9		
Other Field Crops	16446	449.9	13735	1550.9	13464	2019.8
Vegetables	73321	2470.1	73321	2814.0	73321	3265.0
Orchards						
Berries	42078	2007.1	48921	8820.4	50037	12100.2
Nursery, Greenhouse						
Other Crops						
Totals	kal (al.a.	00330 3	m/ce0e	19498.2	136822	17385.0
Total Herbicides, In		23138.1			2099450	

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	46736	4347	4214	8561
1969	46856	4159	4168	8327
1972	45036	4238	3766	8004

Potash, tons\_

# TARLE 2 MANIEUR FROM CATTLE

		Number Cat	tle and Calves
Year Total		Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	897645	537901	359744
1969	785825	449034	336791
1972	795981	462507	333474
Wet Manure Per Anis	Factor: Tons	13.14	6.45
Wet Manure Defecated: Tons, 1972		6077342	2150907
		Nitrogen, tons 4 Phosphorus, tons 8	228249 6078 228 1141

# TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	79096	
1969	63592	19962
1972	60434	68523
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	97299	875724
Nutrients in Wet Manure: Nitrogen, Tons	1362	6042
Phosphorus, Tons	204	876
Potash, Tons	973	5254

# TABLE 5-MANURE FROM CHICKENS & TURKEYS

V	Item	m.t.)	Turkey	Turkeys
Year	rcem	Chickens	Hens	Raised
1964		3314405		
1969		3463154		
1972		3152725	12910	129100
Wet Manure Fa	ctor: Lbs. per bird	82.9	365	89.63
	fecated: Tons, 1972	130680		
Nutrients in	Nitrogen, tons	2039	Combined	8113
	Phosphorus, tons	523		32
	Potash, tons	457	_	28

# TABLE 6-- CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)		Number I-V farms	15615
Number of farms	23765	Acres in I-V farms_	3952356
Acres in farms	4772215	Cropland I-V farms	2653559
Cropland in farms	3066249	Harvested cropland	
Harvested cropland in farms	1969823	I-V farms_	1813365

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	363163	63005	6605	69610
GRAINS	317878	37219	864	38083
Wheat	101767	13425	438	13863
Oats	192332	21722	366	22088
Barley	10564	1179	45	1224
Rye	5028	438	10	448
OTHER FIELD CROPS	97786	26010	565	26575
Soybeans	2362	230	8	238
Potatoes	18386	12825	42	12867
Sugar beets				
Field beans	12070	106		106
HAY OR GRASS SILAGE	888311	13620	409	14029
PASTURED CROPLAND	653616	5495	207	5702
Cropland used for pasture	546489	4262	153	4415
Improved pasture	107127	1233	54	1287
VEGETABLES, SWEET CORN, MELONS	84706	23852	1156	25008
ORCHARDS	62333	9133	502	9635
BERRIES	613	111	1	112
NURSERY & GREENHOUSE PRODUCTS	2668	454	11	465
OTHER CROPS	1114	150	22	172
Total Fertilizer Used, Tons		179155	10342	189497
Percent of Fertilizer Used		95	1.0	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

	1		APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	282787	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	21286	1972			195173
Total	304073	Tonnages for Other Recent Years			
Primary Nutrients in Fertilizer	118588	101	mages for our	Necent ve	
Nitrogen	36766				-
Phosphorus	43876				
Potash	37946				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State		Tons Applied Per "E" Mile
1970-71		ALC:	
1971-72			
1972-73	233740		
Total Esti			ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicid 23138.1			cticides		Fungicides 385.0	Total 60021.3
Manure: Kin	d of		Tons	of Materia	ls ir	Wet Manure	Defecated
Livestock			Manure			Phosphorus	Potasi
wine: Table 2		57869	9	289		81	220
attle: Table 3		8228		46078		8228	41141
Sheep: Table 4		9729		1362		204	973
Horses: Table 4		875724		6042		876	5254
Chickens: Table 5		130680		2039		523	457
Turkeys: Ta	ble 5	8113		127		32	28
Total from Livestock, Tons		9397934		55937		9944	48073
Fertilizers:		To	ns of C	ommercial	Fert	ilizers Appli	ed
				Pr	imar	y Nutrients	-
Item		To	tal	Nitrogen		Phosphorus	Potas
Applied on Cropland: Table 7		304	4073 36766			43876	37946
Lime: Limes Table		alent	purchas	ed or appl	ied,	tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

# 8.2 Planning Subarea 5.1

Planning Subarea 5.1 comprises six western New York counties extending from the shores of Lake Ontario southward to the Pennsylvania border to Allegany County. The largest urban concentration is in Monroe County where Rochester and other cities are located.

# 8.2.1 Agricultural Characteristics

Fruits and vegetables are the major agricultural activites. Apples are the most important fruit crop and are found primarily in Orleans and Monroe Counties. These two counties plus Genesee County produce the majority of the vegetables. Major vegetable crops raised are snap beans, sweet corn, cabbage, onions and tomatoes. Potatoes are grown primarily in Wyoming and Orleans Counties. Dairying is the major livestock enterprise with over 100,000 head of dairy cows and heifers.

Table 8-4 indicates the relative proportions of materials usage in Planning Subarea 5.1 in comparison with the total Great Lakes Basin.

Table 8-4

MATERIALS USAGE BASIN RELATIONSHIP -- PSA 5.1 to GREAT LAKES

Per harvested acre of cropland	Planning Subarea 5.1	Great Lakes Basin
Lbs of chemicals applied Index of chemicals applied	3.11 117	2.66 100
Tons of livestock manure defecated Index of manure defecated	3.95 117	3.37 100
Lbs primary nutrients in livestock man Index primary nutrients in manure	ure 97 118	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	381 7 119	321 22 100
Lbs primary nutrients in commercial fe Index primary nutrients in commercial f	ertilizer 149 Fertilizer 97	153 100
Lbs of lime applied Index of lime used	235 138	170 100
Per acre of total land Lbs road salts used Index road salts used	150.44 360	41.74 100
Tourido (To)	rams (kg) rams (kg)	Multiply By 0.454 907.2 0.907

# 8.2.2 Materials Usage

Table 8-5 lists by county the material usage inventory for Planning Subarea 5.1. Detailed statistics are shown on Tables 8-6 to 8-12.

Table 8-5 MATERIALS USAGE (in 1972)

PSA 5.1	Chemicals Applied to Crops (100 1bs)	Livestock Manure (tons)	Commercial Fertilizer on Cropland (tons)	Limestone Purchased or Applied (tons)	Salt Applied to all Highways (tons)
New York Allegany Genesee Livingston Monroe Orleans Wyoming	1022 2621 2612 3346 5658 2431	382688 378703 427774 206175 207958 638430	6874 20618 20866 16026 22736 21157	13159 7370 8451 6056 11447 20342	4931 38146 22510 88242 12328 19435
TOTAL	17690	2241728	108277	66825	185592
To Convert From Pounds (1bs) Tons (ton)	×			0 907	iply By .454 .2 .907

# 8.2.2.1 Agricultural Chemicals

Agricultural chemicals used in PSA 5.1 totaled 802,410 kilograms (1,769,020 lbs) during 1972. The fruit, vegetable and potato crops account for the fact that 31 percent of the chemicals used are fungicides. Forty percent of the chemicals used are herbicides and 29 percent insecticides. Usage during the next 10 years will increase 15-25 percent overall.

# 8.2.2.2 Animal Wastes

The cattle produce 84 percent of the manure, horses 12, sheep 2 and chickens and swine 1 percent each. There are about 30,000 head of sheep and 660,000 chickens. Livestock manure production in the subarea is 17 percent above the Basin average. All livestock types have either been decreasing or holding their own, except for horses. Horses may increase further in number, but not at the rapid rates of recent years. Manure production should continue to run above average. The 1972 figures for manure production show that 2,033,696 metric tons (2,241,728 tons) were produced.

PLANNING AREA: Lake Ontario 5.0

STATE: New York

PLANNING SUBAREA: West 5.1

COUNTY: 6 County Totals (New York-6)

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used
Corn	138870	3818.7	30860	462.9		
Grains	67339	336.5	22447	224.3		
Hay or Grass Silage	68203	681.7	56837	568.1		
Pastured Cropland	35071	350.4	35071	350.4		
Other Field Crops	7927	221.3	7079	803.2	6977	1046.6
Vegetables	33657	1133.9	33657	1291.7	33657	1498.7
Orchards						
Berries	10125	493.4	11855	1370.2	11904	3038.2
Nursery, Greenhouse Other Crops						
Totals	361192	7035.9	197806	5970.8	52538	5583.5

TARLE	7MANURE	FROM	SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	19814	1871	1789	3660
1969	19732	1585	1537	3122
1972	18947	1587	1415	3002

100 100 MODEL 1 100	701		2000
Wet Manure Factor: Tons	per litter farrowed	7.23	
Wet Manure Defecated: Ton	s, 1972	21704	
Nutrients in Wet Manure:	Nitrogen, tons	109	
	Phosphorus, tons	30	
	Potash, tons	82	

# TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year Total		Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	221087	123180	97907			
1969	193274	102443	90831			
1972	181597	105517	76080			
Wet Manure Per Anii	e Factor: Tons	13.14	6.45			
Wet Manure Tons, 19	Defecated:	1386493	490716			
			9			

# TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	37750	
1969	31781	6715
1972	30198	20829
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	48619	266195
Nutrients in Wet Manure: Nitrogen, Tons	681	1837
Phosphorus, Tons	102	266
Potash, Tons	486	1597

# TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	tem	Chickens	Turkey	Turkeys Raised
1964		661387		
1969		728962		
1972		663391	800	8000
Wet Manure Factor: Lbs.	per bird	82.9	365.0	89.63
wet Manure Defecated: T	ons, 1972	27498		
Nutrients in Wet Manure: Nitroge		429	Combined	503 8
	rus, tons	110		2
Potash,	tons	96		2

/ TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS

COUNTY, land area, acre	2467264	Number I-V farms	3854
Number of farms	6332	Acres in I-V farms	
Acres in farms	1262448	Cropland I-V farms	740902
Cropland in farms	867776	Harvested cropland	
Harvested cropland in	farms 567936	I-V farms	521610

	Crop	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total	
CORN	106018	19490	1661	21151	
GRAINS	112232	13961	359	14320	
Wheat	48538	6533	197	6730	
Oats	56337	6701	145	6846	
Barley	3795	415	13	428	
Rye	2106	214	3	217	
OTHER FIELD CROPS	50284	13409	383	13792	
Soybeans	756	76	A. 100	76	
Potatoes	9602	6819	38	6857	
Sugar beets					
Field beans	1987	54		54	
HAY OR GRASS SILAGE	199035	3093	37	3130	
PASTURED CROPLAND	133817	1495	50	1545	
Cropland used for pasture	111569	1221	31	1252	
Improved pasture	22248	274	19	293	
VEGETABLES, SWEET CORN, MELONS	39131	10187	743	10930	
ORCHARDS	17305	2216	7	2223	
BERRIES	110	10		10	
NURSERY & GREENHOUSE PRODUCTS	1656	340	6	346	
OTHER CROPS	240	30	17	47	
Total Fertilizer Used, Tons		64285	3263	67548	
Percent of Fertilizer Used		95	5	100	

TABLE /FERITLIZER	USED IN 1972	TABLE	APPLIED	MESIONE EQUIV	ALENI
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	100697	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	7580	1972			66825
Total	108277		Con Oak	er Recent Yes	
Primary Nutrients in Fertilizer	42228	100	inages for Ott	er secent lea	IT8
Nitrogen	13092				
Phosphorus	15624				
Potach	13512				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	127960	
Total Estim As Compu	ated Tons Applied on All Hi ted 185592	ghways in 1972-73,

-	Herbicides 035.9	In:	secticides	Fungicides 5583.5	Total 17690.2
Table 1 7	932+3	2505		27/2/2/2	
Manure: Kind	of	Tons		in Wet Manure	
Livestock		Manur	e Nitrogen		Potash
Swine: Table	2 21	704	109	30	82
Cattle: Table	3 18	77209	10512	1877	9386
Sheep: Table		619	681	102	486
Horses: Table 4		6195	1837	266	1597
Chickens: Tab		27498 429		110	96
Turkeys: Tabl		13.	8	2	2
Total from Liv Tons	estock,	41728	13576	2387	11649
Fertilizers:		Tons of		rtilizers Applie	ed
			Prin	ary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on Cro	pland:	3277	13092	15624	13512

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Salts: Applied on all highways, tons: Table 9 185592

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds

PLANNING AREA: Lake Ontario 5.0 STATE: New York

PLANNING SUBAREA: West 5.1

COUNTY: Allegany

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS.	1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	10800	297.0	2400	36.0		
Grains	7589	37.9	2530	25.3		
Hay or Grass Silage	15815	158.1	13179	131.7		
Pastured Cropland	9657	96.5	9657	96.5		
Other Field Crops	194	5.8	215:	24.7	215	32.2
Vegetables	48	1.6	48	1.8	48	211
Orchards						
Berries	136	6,7	157	32.7	163	35.3
Nursery, Greenhouse						
Other Crops						
Totals	44239	603.6	28186	348.7	426	69.6
Total Herbicides, In	secticide	s, Fungic	ides: 10	0 lbs	72851	1021.9

### TABLE 2-MANURE FROM SWINE

/ear	Hog & Pig Inventory Dec. 1		June 1-Nov. 30	Total
1964	1428	104	92	100
1969	1952	162	186	3)18
1972	1874	177	157	334

### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	39912	22615	17297			
1969	35080	18651	1.6429			
1972	33062	19211	13851			
Wet Manure Per Anim	Factor: Tons	13.14	6.45			
Wet Manure Tons, 19	Defecated: 72	252433	89339			
	Defecated: Tons, 1972 in Wet Manure: Nitrog Phosph Potash	en, tons 1914 orus, tons 342				

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	7476	
1969	6821	1091
1972	6480	1800
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	10433	23004
Nutrients in Wet Manure: Nitrogen, Tons	146	159
Phosphorus, Tons	22	23
Potash, Tons	104	138

# TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	90685		
1969	130926		
1972	119143	200	5000
Wet Manure Factor: Lbs. per bird	82:9	365.0	89.63
Wet Manure Defecated: Tons, 1972	4938		
Nutrients in Wet Manure: Nitrogen, tons	77	Combined	126
Phosphorus, tons	20	1	1
Potash, tons	17	1915	0

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	67028	Number I-V farms	629
Number of farms	1112	Acres in I-V farms	184389
Acres in farms	254489	Cropland I-V farms	101351
Cropland in farms	132322	Harvested cropland	
Harvested cropland in farms	76203	I-V farms	64407

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	8059	1483	104	1587
GRAINS	12649	1347	24	1371
Wheat	645	68	0	68
Oats	11278	1215	24	1239
Barley	451	30	0	30
Rye	8	0	0	0
OTHER FIELD CROPS	533	263	0	263
Soybeans	0	0	0	0
Potatoes	298	226	0	226
Sugar beets				
Field beans	359	14	0	14
HAY OR GRASS SILAGE	43162	670	0	670
PASTURED CROPLAND	35133	306	21	327
Cropland used for pasture	28261	195	19	214
Improved pasture	6872	111	2	113
VEGETABLES, SWEET CORN, MELONS	57	9	0	9
ORCHARDS	140	27	0	27
BERRIES	2	1	0	1
NURSERY & GREENHOUSE PRODUCTS	4	1	0	1
OTHER CROPS	4	0	0	0
Total Fertilizer Used, Tons		4121	149	4270
Percent of Fertilizer Used		97	3	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

IABLE /FERTILIZER USED IN 1972		TABLE	APPLIED	MESIONE EQUIV	ALLENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	6393	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	6874	1972			13159
Total Primary Nutrients in Fertilizer		Ton	nages for Oth	er Recent Yea	rs
Nitrogen	831				
Phosphorus	992				
Potash	858				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Tons Applied Per Through State "E" Mile
1970-71	
1971-72	
1972-73	3400
Total Est As Com	imated Tons Applied on All Highways in 1972-73,

### TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide 603.6	s Ir 348.	secticides 7	Fungicides 69.6	Total 1021.9		
Manure: Kin		A STATE OF THE PARTY OF THE PAR		ls in Wet Manure	-		
Livestock		Manur					
Swine: Tabl	e 2	2415	12	3	9		
Cattle: Tab	le 3	341772	1914	342	1709		
Sheep: Table 4		10433	146	22	104		
Horses: Table 4		23004	159	23	138		
Chickens: Table 5		4938	77	20	17		
Turkeys: Table 5		126	2	1	0		
Total from L Tons		382688	2310	411	1977		
Fertilizers:		Tons of	Commercial	Fertilizers Appli	ed		
			Primary Nutrients				
Item		Total	Nitrogen	Phosphorus	Potasi		
Applied on Cropland: Table 7		6874	831	992	858		
Lime: Limes	tone equiva	lent purch	ased or appl				

To Convert From

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 ,4047 907.2

PLANNING AREA: Lake Ontario 5.0

STATE: New York COUNTY: Genesee

PLANNING SUBAREA: West 5.1

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops         Acres Treated         Amount Used 100 lbs         Acres Treated 100 lbs         Amount 100 lbs         Acres Treated 100 lbs         Tr	Acres Treated	Amount Used 100 lbs				
Corn	30150	829.1	6700	100.5		
Grains		68.5	4570			
Hay or Grass Silage		107.6				
Pastured Cropland	3554	35.5		35.5		
Other Field Crops	389	11.0			354	53.1
Vegetables	9893	333.3	9893	379.7	9893	440.5
Orchards						
Berries	105	6.7	113	13.5	116	30.7
Nursery, Greenhouse						
Other Crops						
	22.32		27.440	2007.0	100/0	COL 3
Totals Herbicides, In	68564	1391.7	34157	705.2 0 1bs	10363 11308h	524.3

TARLE 2-MANURE FROM SWINE

	Hog & Pig	Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	4391	376	350	726
1969	2687	299	188	487
1972	2580	248	220	468

Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons

Year	m 1	Cows & Heifers	Heifers, Steers,
	Total	Calved	Bulls, Calves
1964	361148	20038	16110
1969	31152	16638	14514
1972	29493	17137	12356
Wet Manure Per Anima	Factor: Tons	13,14	6,45
Wet Manure Tons, 197		225180	79696

TABLE 4MANURE FROM SHEEP AND HORSES		
Year Item	Sheep & Lambs	Horses & Ponies
1964	5856	
1969	5337	1133
1972	5856 5337 5070	4317
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	8163	55171
Nutrients in Wet Manure: Nitrogen, Tons	114	381
Phosphorus, Tons	17	55
Potech Tong	82	331

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	142135		04.00
1969	188471		-
1972	171509		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	7109		
Nutrients in Wet Manure: Nitrogen, tons	111	Combined	
Phosphorus, tons	28		
Potash, tons	25		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1) 320576	Number I-V farms	618
Number of farms 1029	Acres in I-V farms	166615
Acres in farms 196648	Cropland I-V farms	130027
Cropland in farms 148781	Harvested cropland	
Harvested cropland in farms 105228	I-V farms	97718

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	2220/1	4063	357	1420
GRAINS	22850	2925 1660	80	3005
Wheat	11923	1660	53	1713
Cats	9010	1073	16	1089
Barley	1080	143	11	154 35
Rye	475	35	0	35
OTHER FIELD CROPS	9806	1766	69	1835
Soybeans	31	3	0	3
Potatoes	31 490	276	0	276
Sugar beets				
Field seeds	246	5	0	15
HAY OR GRASS SILAGE	32401	408	2	1410
PASTURED CROPLAND	13992	176	6	182
Cropland used for pasture	11709	157	6	163
Improved pasture	2283	19	0	19
VEGETABLES, SWEET CORN, MELONS	11559	2666	203	2869
ORCHARDS	59	9	0	9
BERRIES	25	0	0	
NURSERY & GREENHOUSE PRODUCTS	273	133	0	133
OTHER CROPS	0	0	0	0
Total Fertilizer Used, Tons		12151	717	12868
Percent of Fertilizer Used	No. of Concession, Name of Street, or other Persons, Name of Street, or ot	94	6	100

TABLE 7FERTILIZER	LE 7FERTILIZER USED IN 1972		APPLIED					
Item	Tons		Tonnage	Tonnage not				
Fertilizer Used on Crops: Solid	19175	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage			
Liquid	1143	1972			7370			
Total	20618		mages for Oth	er Recent Yea				
Primary Nutrients in Fertilizer	8041	100	nages ser van					
Nitrogen	2493	_						
Phosphorus	2975							
Detech	2573							

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	26300	
Total Estim	ated Tons Applied on All F ted 38146	lighways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	es l	Insecticides		Total
Table 1	1391.7	709	2	524.3	2621.2
Manure: K:	ind of	To	ons of Materia	als in Wet Manure	Defecated
Livesto		Many	ire Nitros	gen Phosphoru	s Potash
Swine: Tal		3384	17	5	13
Cattle: T		304876	1707	305	1524
Sheep: Tal		8163	114	17	82
Horses: To		55171	381	55 28	331
Chickens:		7109	111	28	331 25 0
Turkeys:		0	0	0	0
	Livestock,	378703	2330	410	1975
Fertilizer	91	Tons		Fertilizers Appl	ied
10101			P	rimary Nutrients	
It	em	Total	Nitroger	Phosphorus	Potash
Applied on Table 7	Cropland:	20618	2493	2975	2573

Lime: Limestone equivalent purchased or applied, tons: Table 8 7370

Salts: Applied on all highways, tons: Table 9 38146

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047

Agricultural Chemicals, Manures, Fertilizers, Lime and Highway De-Icing Compounds

PLANNING AREA: Lake Ontario 5.0 STATE: New York

PLANNING SUBAREA: West 5.1

TARTE	1-PSTTMATED	AMOUNTES	OF	CHEMICALS	HSED	ON	CROPS	1972	

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	33660	925.6	7480	112.2		
Grains	15134	75.6	5045	50.4		
Hay or Grass Silage	11608	116.0	9674	96.7		
Pastured Cropland	7485	74.8	7485	74.8		
Other Field Crops	1817	49.8	1530	172.9	1501	225.2
Vegetables	3909	131.7	3909	150.0	3909	174.1
Orchards						
Berries	309	14.2	362	86.8	375	81.4
Nursery, Greenhouse						
Other Crops						
Totals	73922	1387.7	35485	743.8	5785	480.7
Total Herbicides, In		s, Fungio	ides: 10	0 1bs	115192	2612.2

TABLE 2-MANUER FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	3716	285	326	611
1969	5392	421	490	911
1972	5176	463	412	875

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	40994	21592	19402		
1969	35083	17745	17338		
1972	31455	18277	13178		
Wet Manur		13.14	6,45		
Wet Manure Defecated: Tons, 1972		240160	84998		
	e Defecated: Tons, 1972 in Wet Manure: Nitroge Phospho Potash	en, tons 1821 orus, tons 325			

TABLE 4--MANURE FROM SHEEP AND HORSES

Year	Item	Sheep &	Horses & Ponies
1964		10711	
1969		9473	1584
1972		9000	6035
Wet Manure Factor	: Tons per animal	1.61	12.78
Wet Manure Defeca		14490	77127
Nutrients in Wet	Manure: Nitrogen, Tons	203	532
	Phosphorus, Tons	30 145	77
	Potash, Tons	145	463

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	150135		
1969	123889		
1972	112739		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	14673		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	73		
Phosphorus, tons	19		
Potash, tons	16		

Pounds (1b)

Acres (acre) Tons (ton) COUNTY: Livingston

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	408448	Number I-V farms	627
Number of farms	1038	Acres in I-V farms	205418
Acres in farms	249290	Cropland I-V farms	152304
Cropland in farms	178295	Harvested cropland	
Harvested cropland in farms	113795	I-V farms	105580

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	26433	4238	416	4654
GRAINS	25223	3074	84	3158
Wheat	12253	1652	20	1672
Oats	11663	1303	63	1366
Barley	847	100	0	100
Rye	193	9	0	9
OTHER FIELD CROPS	14808	3137	133	3270
Soybeans	138	41	0	41
Potatoes	2064	1275	0	1275
Sugar beets	1000000			
Field beans	592	3	0	3
HAY OR GRASS SILAGE	34002	418	2	420
PASTURED CROPLAND	28075	362	0	362
Cropland used for pasture	24170	306	0	306
Improved pasture	3905	56	0	56
VEGETABLES, SWEET CORN, MELONS	4535	886	149	1035
ORCHARDS	386	80	0	80
BERRIES	3	0	0	0
NURSERY & GREENHOUSE PRODUCTS	864	34	0	34
OTHER CROPS	12	2	1	3
Total Fertilizer Used, Tons		12234	785	13019
Percent of Fertilizer Used		94	6	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED			
Item	Tons		Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	19405	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	1461	1972			8451	
Total 20866		Tonnages for Other Recent Years				
Primary Nutrients in Fertilizer	8138	101	mages for our	let meteric rea		
Nitrogen	2523					
Phosphorus	3011					
Potash	2604					

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	15520	
Total Est:	imated Tons Applied on All Hi puted 22510	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	s Inse	cticides	Fungicides	Total
Table 1	1387.7	743.8		480.7	2612.2
Manure: K	ind of	Tons	of Material	s in Wet Manure	Defecated
Livesto	ck	Manure	Nitroge	n Phosphorus	Potasi
Swine: Tal	ole 2	6326	32	9	24
Cattle: Ta	able 3	325158	1821	325	1626
Sheep: Tal	ole 4	14490	203	30	145
Horses: Ta	able 4	77127	532	77	463
Chickens:	Table 5	4673	73	19	16
Turkeys:	Table 5	0	0	0	0
Total from Tot	Livestock,	427774	2661	460	2274
Fertilizer	5:	Tons of C		Fertilizers Appli	ed
				mary Nutrients	Pot asi

Lime: Limestone equivalent purchased or applied, tons:
Table 8 8451

Salts: Applied on all highways, tons: Table 9 22510

To Convert From To Multiply By

Kilograms (kg)
Hectare (ha)
Kilograms (kg)

Multiply By 0.453 .4047 907.2

PLANNING AREA: Lake Ontario 5.0 STATE: New York PLANNING SUBAREA: West 5.1 COUNTY: Monroe

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS	1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used
Corn	16650	457.8	3700	55.5		
Grains	11201	56.0	3734	37.3		
Hay or Grass Silage	7237	72.3	6031	60.3		
Pastured Cropland	3760	37.6	3760	37.6		
Other Field Crops	1012	24.9	549	59.5	515	77.3
Vegetables	7588	255.6	7588	291.2	7588	337.9
Orchards						
Berries	3107	152.5	3627	411.0	3643	922.0
Nursery, Greenhouse						-
Other Crops						
Totals	50555	1056.7	28989	952.4	11746	1337.2
Total Herbicides, In				0 1bs	91290	3346.

#### TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	3902	453	450	903
1969	21415	55	70	125
1972	2347	64	56	120

 
 Wet Manure Factor:
 Tons per litter farrowed
 7,23

 Wet Manure Defecated:
 Tons, 1972
 868

 Nutrients in Wet Manure:
 Nitrogen, tons
 1
 Phosphorus, tons Potash, tons

		Number Cattle	
Year	Total	Cows & Heifers Calved	Heifers, Steers Bulls, Calves
1964	26770	14536	12234
1969	18582	9193	9389
1972	16296	9469	6827
Wet Manur Per Ani	e Factor: Tons mal	13,14	6,45
Wet Manure Defecated: Tons, 1972		124423	141034
	e Defecated: Tons, 1972 in Wet Manure: Nitroge Phospho Potash	en, tons 943 orus, tons 168	

Year Ite	m	Sheep & Lambs	Horses & Ponies
1964		1337	
1969		1337 872 828	1281
1972		628	21485
Wet Manure Factor: Tons pe	er animal	1,61	12,78
Wet Manure Defecated: Tons		1333	31720
Nutrients in Wet Manure: 1	Nitrogen, Tons	19	219
	Phosphorus, Tons	3	32 190
	Potash, Tons	13	190

#### TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		132095	419	
1969		90660	- marie	
1972		82500	600	6,000
Wet Manure Fac	ctor: Lbs. per bird	82.9	365.0	89.63
wet Manure Dei	ecated: Tons, 1972	3420		
Nutrients in Wet Manure: Nitrogen, tons		53	Combined	377
	Phosphorus, tons Potash, tons	114		2

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 132128 (1)	Number I-V farms 602
Number of farms 1085	Acres in I-V farms 125610
Acres in farms 156405	Cropland I-V farms 102137
Cropland in farms 123654	Harvested cropland
Harvested cropland in farms 79813	I-V farms 72625

	Grop	Tons	of Fertilize	r Used
Crops	Acres	Dry		
CORN	11111	1949	200	21/19
GRAINS	18668	2293	135	Sh28
Wheat	10498	2293	100	1453
Oats	6656	782	30	
Barley	553	782 59	2	61
Rye	797	9/1	3	97
OTHER FIELD CROPS	7406	11,97	61	1558
Soybeans	1147	1 5	0	15
Potatoes	693	li2li	5	1/29
Sugar beets				
Field seeds	155	0	0	0
HAY OR GRASS SILAGE	20821	300	29	329
PASTURED CROPLAND	14193	73	29	94
Cropland used for pasture	11043	62	14	9/4 66
Improved pasture	3150	11	17	28
VEGETABLES, SWEET CORN, MELONS	8722 5646 60	2221	192	2413
ORCHARDS	5646	866	7	873
BERRIES	60	7	0	7
NURSERY & GREENHOUSE PRODUCTS	459	105	6	111
OTHER CROPS	199	26	16	142
Total Fertilizer Used, Tons		9337	667	10000
Percent of Fertilizer Used		93	7	100

TABLE 7FERTILIZER	USED IN 1972	TABLE	B-GROUND LI APPLIED	WESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	1149014	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid Total	16026	1972			6056
Primary Nutrients in Pertilizer		Ton	nages for Oth	er Recent Yea	TS .
Nitrogen	1938				
Phosphorus	2312				
Potash	2000				

# TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per
1970-71		
1971-72		
1972-73	6081(0	
Total Estim	ated Tons Applied on All Ri ted 882h2	ghways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1 1056.7	es In	secticides	Fungicides 1337.2	3346.3
Manure: Kind of	Tor	s of Material	s in Wet Manure I	efecated
Livestock	Manur			
Swine: Table 2	868	1		3
Cattle: Table 3	168457	943	168	8h2
Sheep: Table 4	1333	19	3	13
Horses: Table 4	31.720	219	32	190
Chickens: Table 5	3420	53	14	12
Turkeys: Table 5	377	6	2	1
Total from Livestock, Tons	206175	1214	220	1061
Fertilizers:	Tons of	Commercial F	ertilizers Applie	d
			mary Nutrients	
Item	Total	Nicrogen	Phosphorus	Potash
Applied on Cropland: Table 7	16026	1938	2312	2000

Table 8 6056

Salts: Applied on all highways, tons: Table 9 882h2

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
			W 7.00			44000000		

Laminatio Ameri	Date Chest to Neo	Contract Now Positi	
PLANNING SUBAREA	1: West 5.1	COUNTY: Orleans	

TARLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS-	1972
TABLE	1ESTIMATED	AMOUNTS	UF	CHEMICALS	USED	UN	CKUPS,	- 1

	Herbi	cides	Insect	icides	Fungicides		
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	
Corn	21690	596.4	4820	72.3			
Grains	8683	43.4	2894	28.9			
Hay or Grass Silage	5616	56.1	4680	46.8			
Pastured Cropland	3399	33.9	3399	33.9			
Other Field Crops	1922	52.5	1599	180.5	1567	235.0	
Vegetables	11552	389.2	11552	143.4	11552	514.4	
Orchards						CONTRACTOR OF	
Berries	6153	297.0	7234	769.7	7239	1864.1	
Nursery, Greenhouse							
Other Crops							
Totals	59015	11,68.5	36178	1575.5	20358	2613.5	
Total Herbicides, In				0 lbs	115551	5657.5	

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Sou	ws Farrowing	
Year Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	5262	522	1462	984
1969	60h1	524	509	1033
1972	5800	525	1470	995

1972 5800	525	1470	995
Wet Manure Factor:	Tons per litter farrowed	1 7,23	
Wet Manure Defecated	: Tons, 1972	7194	
Nutrients in Wet Man	ure: Nitrogen, tons	36	
	Phosphorus, tons	10	
	Potash, tons	27	

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	20572	9679	10893		
1969	19740	7958	11782		
1972	14109	8197	5912		
Wet Manur Per Ani		13.14	6.45		
Wet Manur Tons, 1	e Defecated: 972	107709	38132		
	e Defecated: Tons, 1972 in Wet Manure: Nitroge Phosphe Potash,	en, tons 817 orus, tons 146			

### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	7521 6514 6220	
1969	65144	81,14
1972	6220	3216
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	10014	41100
Nutrients in Wet Manure: Nitrogen, Tons	140	284
Phosphorus, Tons	21	41
Potash, Tons	100	247

#### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	79367		- mm
1969	100946	- man	-
1972	91900		m.m.
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	3809		i eren
Nutrients in Wet Manure: Nitrogen, tons	59	Combined	
Phosphorus, tons	15		-
Potash, tons	13		16.00

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres 253140 (1)	Number I-V farms 552
Number of farms 928	Acres in I-V farms 140276
Acres in farms 166176	Cropland I-V farms 114344
Cropland in farms 129628	Harvested cropland
Harvested cropland in farms 83271	I-V farms 78266

	Crop	Tons o	f Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	15193	3116	223	3339
GRAINS	11/1/72	1969	22	1991
Wheat	8394	1177	22	1199
Oats	5337 415	723 48	0	729 48
Barley	415	48	0	48
Rye	200	17	0	17
OTHER FIELD CROPS	8740	2615	81	2696
Soybeans	1,00	20	0	20
Potatoes	2170	1257	0	1257
Sugar beets			an an	***
Field seeds	140	12	0	12
HAY OR GRASS SILAGE	16217	227	0	227
PASTURED CROPLAND	12125	243	1	Slili
Cropland used for pasture	10910	232	1	233
Improved pasture	1215	11	0	11
VEGETABLES, SWEET CORN, MELONS	13535	4224	198	141422
ORCHARDS	10735	1196	0	1196
BERRIES	56	2	0	2
NURSERY & GREENHOUSE PRODUCTS	56	67	0	67
OTHER CROPS	15	0	0	0
Total Fertilizer Used, Tons		13671	525	14196
Percent of Fertilizer Used		96	L	100

# TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	21144	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1592	1972			111/17
Total	22736	Tonnages for Other Recent Year			
Primary Nutrients in Fertilizer	8867	100	nages for our	er necent ree	
Nitrogen	2749				
Phosphorus	3281				
Potash	2837				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	8500	
Total Estima As Comput	ted Tons Applied on All Hi	ghways in 1972-73,

TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide		secticides .5	Fungicides 2613.5	Total 5657.5
		-		A STATE OF THE PARTY OF THE PAR	Association of the last of the
Manure: Ki		Manur	And in case of the last of the	ls in Wet Manure en Phosphorus	
Swine: Tab	le 2	7194	36	10	27
Cattle: Ta	able 3	145841	817	146	729
Sheep: Table 4		10014	140	21	100
		11100	284	141	21.7
Chickens:	Chickens: Table 5 3809		59	15	13
Turkeys: 7	Table 5	0	0	0	0
Total from Livestock, Tons		207958	1336	233	1116
Fertilizers	3.1:	Tons of		Fertilizers Appli	ed
				imary Nutrients	
Ite	3m	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7 22		22736	2749	3281	2837

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 12328

PLANNING AREA:_	Lake Ontario	5.0	STATE:	New York	
PLANNING SUBAREA	: West 5.1		COUNTY:	Wwoming	

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres	Amount Used
Corn	25920	712.8	5760	86.4		
Grains	11022	55.1	3674	36.7		
Hay or Grass Silage	17164	171.6	14304	143.0		
Pastured Cropland	7216	72.1	7216	72.1		
Other Field Crops	2593	77.3	2828	324.9	2825	423.8
Vegetables	667	22.5	667	25.6	667	29.7
Orchards						- CZ-L
Berries	315	16.3	362	56.5	368	104.7
Nursery, Greenhouse						1000
Other Crops						
Totals	64897	1127.7	34811	745.2	3860	558.2
Total Herbicides, In	secticide			0 1bs	103568	2431.1

2MANURE	

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1115	131	118	249
1969	1215	124	94	218
1972	1170	110	100	210

Wet Manure Factor: Tons per litter farrows
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

TARTE 3 MANUER FROM CATTLE

		Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	56691	34720	21971		
1969	53637	32258	21379		
1972	57182	33226	23956		
Wet Manure Per Anim	Factor: Tons	13.14	6.45		
Wet Manure Tons, 19	Defecated:	436590	154516		
	Defecated: Tons, in Wet Manure: Ni Ph				

TABLE	4MANURE	FROM	SHEEP	AND	HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	4849	
1969	2734	782
1972	2600	2979
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	4186	38072
Nutrients in Wet Manure: Nitrogen, Tons	59	263
Phosphorus, Tons	9	38
Potash, Tons	42	228

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	66970		
1969	94070		
1972	85600		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	3548		
Nutrients in Wet Manure: Nitrogen, tons	55	Combined	
Phosphorus, tons Potash, tons	14		

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acre	es 1) 382464	Number I-V farms	826
Number of farms	1140	Acres in I-V farms	210614
Acres in farms	239440	Cropland I-V farms	140442
Cropland in farms	155096	Harvested cropland	
Harvested cropland in	farms109666	I-V farms	103014

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	23018	4641	361	5002
GRAINS	18370	2353	14	2367
Wheat	4825	623	2	625
Oats	12393	1605	12	1671
Barley	449	35	0	35
Rye	433	59	0	59
OTHER FIELD CROPS	8991	4131	39	4170
Soybeans	40	7	0	7
Potatoes	3887	3361	33	3394
Sugar beets				
Field beans	495	20	0	20
HAY OR GRASS SILAGE	52432	1070	14	1074
PASTURED CROPLAND	30299	335	1	336
Cropland used for pasture	25476	269	1	270
Improved pasture	4823	66	0	66
VEGETABLES, SWEET CORN, MELONS	723	181	1	182
ORCHARDS	339	38	0	38
BERRIES	15	0	0	0
NURSERY & GREENHOUSE PRODUCTS	0	0	0	0
OTHER CROPS	10	2	0	2
Total Fertilizer Used, Tons		12771	420	13191
Percant of Fertilizer Used		97	3	0

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

			APPLIED	THE RESERVE OF THE PARTY OF THE	
Item	Tons	Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	19676	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1481	1972			20342
Total	21157		nance for Oth	er Recent Yea	
Primary Nutrients in		100	nages for och	ET VECEUT YES	1.0
Fertilizer	8251				
Nitrogen	2558				
Phosphorus	3053				
Potash	2640				

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	13400	
Total Est As Com	imated Tons Applied on All Hi	ghways in 1972-73,

Table 1	Herbicide		secticides 2	Fungicides	2431.1
Manure: Kin				als in Wet Manure	- Harana Marana
Livestock		Manu		gen Phosphoru	
Swine: Table		1518	8	2	6
Cattle: Tab		591106	3310	591	2956
Sheep: Tabl		4186	59	9	42
Horses: Table 4		38072	263	38	228
Chickens: Table 5 Turkeys: Table 5 Total from Livestock, Tons		3548	55	14	12
		0	0	0	0
		638430	3695	654	3244
Fertilizers:		Tons of	Commercial	Fertilizers Appl	ied
ICICILIANO.			P	rimary Nutrients	
Item		Total	Nitroge	n Phosphorus	Potasi
Applied on C Table 7	ropland:	21157	2558	3053	2640
Titmae	tone equiva	lent purch	nased or app.	lied, tons:	

To Convert From Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

# 8.2.2.3 Commercial Fertilizers

Fertilization rates are running well above the Basin average in this planning subarea and are projected to continue with perhaps some increases, especially in nitrogen. The 1972 total of commercial fertilizer applied to cropland was 98,229 metric tons (108,277 tons). Nitrogen accounted for 31 percent, phosphorus 37 percent, and potash 32 percent of the primary nutrients in the commercial fertilizer.

### 8.2.2.4 Lime

Lime rates are also applied at rates above Basin average. These levels are expected to continue into the near future. The amount of lime purchased or applied in PSA 5.1 was 60,624 metric tons (66,825 tons) for 1972.

### 8.2.2.5 Salts

Road de-icers are used in greater quantities in PSA 5.1 than for the Basin as a whole. Highway people expect future quantities used to depend more on increased road mileage rather than higher usage rates. The total amount of salts applied to highways in this area (1972-73) was 168,369 metric tons (185,592 tons).

# 8.3 Planning Subarea 5.2

Planning Subarea 5.2 extends from Rochester on the west, east through the Finger Lake regions encompassing the city of Syracuse and then to Oneida and Herkimer Counties. It is a large land area and diversified in its agriculture. These counties follow along the southern shores of Lake Ontario. Most of the counties do not border directly on the lake.

# 8.3.1 Agricultural Characteristics

Planning Subarea 5.2 is generally a strong agricultural area. The general crops grown are corn, grains and hay primarily to support the livestock, which is mainly dairy. Fruit and vegetable crops are also very important. Apples, and to a lesser extent, cherries, are important in Wayne County. There are nearly 4,000 hectares (10,000 acres) of grapes in the subarea with Yates County being the heaviest producer. The major vegetable crops are snap beans, sweet corn, cabbage, onions and tomatoes.

Table 8-13 indicates the relative proportions of materials usage in Planning Subarea 5.2 in comparison with the total Great Lakes Basin.

Table 8-13

MATERIALS USAGE BASIN RELATIONSHIP -- PSA 5.2 to GREAT LAKES

Per harvested acre of cropland	Planning Subarea 5.2	Great Lakes Basin
Lbs of chemicals applied Index of chemicals applied	3.78 142	2.66 100
Tons of livestock manure defecated Index of manure defecated	4.61 137	3.37 100
Lbs primary nutrients in livestock m Index primary nutrients in manure	nanure 113 138	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	340 7 106	321 22 100
Lbs primary nutrients in commercial Index primary nutrients in commercial		153 100
Lbs of lime applied Index of lime used	189 111	170 100
Per acre of total land area		
Lbs road salts used Index road salts used	45.33 109	41.74 100
Tons (ton) Kilo	To ograms (kg) ograms (kg) ric Tons	Multiply By 0.454 907.2 0.907

# 8.3.2 Materials Usage

Table 8-14 lists by county the material usage inventory for PSA 5.2. Detailed statistics are shown in Table 8-15 to 8-27.

Table 8-14
MATERIALS USAGE
(in 1972)

PSA 5.2	Chemicals Applied to Crops (100 lbs)	Livestock Manure (tons)	Commercial Fertilizer on Cropland (tons)	Limestone Purchased or Applied (tons)	Salts Applied to all Highways (tons)
New York			Bellestat Are	ALC: ASSESSED	LI DE MARKET
Cayuga	2946	500081	25077	6899	7470
Herkimer	1048	521176	5357	8123	4206
Madison	1860	654286	13122	12061	6092
Oneida	2463	821125	15184	19324	14649
Onondaga	2316	458764	15158	6480	29008
Ontario	3902	379330	25728	3278	8572
Oswego	1485	298448	8235	7639	16100
Schuyler	1502	96427	2685	3291	5802
Seneca	1320	123045	12106	3727	3916
Tompkins	926	277805	7973	8453	5700
Wayne	12632	287394	26942	10592	19435
Yates	5028	148713	10869	3741	2611
TOTAL	37428	4566593	168436	93608	123561
To Convert F	rom	To	)	Multipl	to the same of the
Pounds (1b)		Kilogra	ams (kg)	0.454	a contract to the
Tons (ton)		Kilogra Metric	ams (kg) Tons	907.2	7

# 8.3.2.1 Agricultural Chemicals

A total of 1,699,200 kilograms (3,742,790 lbs) of agricultural chemicals were used in this area during 1972. Fruit and vegetable crops along with potatoes account for 31 percent of the chemical usage being fungicides. Thirty five percent are herbicides and 34 percent insecticides. The use of chemicals will increase 15-20 percent in the next 10 years.

# 8.3.2.2 Animal Wastes

There are 4,142,813 metric tons (4,566,593 tons) of wet manure produced from livestock in PSA 5.2. Cattle contribute 86 percent of the manure, horses 10, chickens 2 and swine and sheep each 1 percent. The manure production index is above average. Manure rates may stay about the same or even decrease some but are expected to still continue above the Basin average. Nitrogen, phosphorus, and potash combined comprise 1.2 percent of the total manure tonnage.

# 8.3.2.3 Commercial Fertilizers

Fertilizer use in Planning Subarea 5.2 is slightly above the Basin average. Thirty one percent of the primary nutrients are nitrogen, thirty two percent potash. Fertilizer usage will increase 10-20 percent in the next 10 years. The 1972 usage totaled 152,805 metric tons (168,436 tons) of commercial fertilizer that was applied to croplands.

PLANNING AREA: Lake Ontario 5.0 STATE: New York

PLANNING SUBAREA: Central 5.2

COUNTY: 12 County Totals (New York-12)

Crop Group Amount Amount Amount Or Acres Used Acres Used Acres Used Acres Used		Herbicides		Insecticides		Fungicides	
Grains         103344         516.3         34448         343.9           Hay or Grass Silage         132110         1320.5         110092         1100.5           Pastured Cropland         75404         753.4         75404         753.4           Other Field Crops         8227         219.8         6331         710.3         6162         924.4           Vegetables         39456         1329.2         39456         1514.3         39456         1757.1           Orchards         Berries         31875         1508.6         36983         7435.9         38045         9045.0           Nursery Greenhouse         0ther Crops         0ther Crops         256.2         361774         12744.2         83664         11727.5	107.7.0		Used		Used	Acres	Amount Used
Crains         103344         516.3         34448         343.9           Hay or Grass Silage         132110         1320.5         110092         1100.5           Pastured Cropland         75404         753.4         75404         753.4         75404         753.4         75404         753.4         710.3         5162         924.4           Vegetables         39456         1329.2         39456         1514.3         39456         1757.1           Orchards         Berries         31875         1508.6         36983         7435.9         38046         9045.0           Nursery, Greenhouse         0ther Crops         0ther Crops         361774         12744.2         83664         11727.5	Corn	265770	7308.4	59060	885.9		
Pastured Cropland 75404 753.4 75404	Grains	103344	516.3	34448			
Other Field Crops         8227         219.8         6331         710.3         6162         924.4           Vegetables         39456         1329.2         39456         1514.3         39456         1757.1           Orchards         Berries         31875         1508.6         36983         7435.9         38046         9046.0           Nursery Greenhouse         Other Crops         0<	Hay or Grass Silage	132110	1320.5	110092	1100.5		
Vegetables         39456         1329.2         39456         1514.3         39450         1757.1           Orchards         Berries         31875         1508.6         36983         7435.9         38046         9045.0           Nursery, Greenhouse         Other Crops         0	Pastured Cropland	75404	753.4	75404	753.4		
Vegetables         39456         1329.2         39456         1514.3         39456         1757.1           Orchards         Berries         31875         1508.6         36983         7435.9         38046         9046.0           Nursery, Greenhouse         Other Crops         0	Other Field Crops	8227	219.8	6331	710.3	6162	924.4
Orchards         31875         1508.6         36983         7435.9         38046         9045.0           Nursery, Greenhouse         Other Crops         Totals         656186         12956.2         361774         12744.2         83664         11727.3	Vegetables	39456	1329.2	39456	1514.3	39456	
Nursery, Greenhouse Other Crops	Orchards						
Other Crops  Totals 656186 12956.2 361774 12744.2 83664 11727.		31875	1508.6	36983	7435.9	38046	9045.0
Totals 656186 12956.2 361774 12744.2 83664 11727.	Nursery, Greenhouse						
12/01/2   20/11/2   20/11/2   20/01/2   24/2/4/	Other Crops						
12/010   20/11	Tatalo	656196	10056 0	261 <i>00</i> h	10011 0	0.277	11000 6

TABLE	2MANURE	FROM	SWINE

Hog & P:		Number So		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	22672	2144	2113	4257
1969	23815	2229	2315	4544
1972	22869	2313	2055	4368

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	434748	260132	174616			
1969	377387	214482	162905			
1972	380202	220917	159285			
Wet Manure Per Anim	Factor: Tons	13.14	6.45			
Wet Manure Tons, 19	Defecated: 72	2902849	1027388			
			37			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year	Item	Sheep & Lambs	Horses & Ponies
1964		37644	
1969		30133	9934 36059
1972		28639	36059
Wet Manure Factor: 1	ons per animal	1.61	12.78
Wet Manure Defecated:		46109	460834
Nutrients in Wet Many		646	3180
	Phosphorus, Tons	97	461
	Potash, Tons	461	2765

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		2203190		
1969		2474048		
1972		2252438	7110	71100
Wet Manure Fac	tor: Lbs. per bird	82.9	365	89.63
wet Manure Def	ecated: Tons, 1972	93364		
Nutrients in W	et Manure: Nitrogen, tons	1456	Combined	4468 70
	Phosphorus, tons	373		18
	Potash, tons	327		16

TABLE 6--CROP ACREACES & PERTILIZED HOPE OF ACC T II CONCHE DADAGE

COUNTY, land area, acres (1)	5450816	Number I-V farms 8179	
Number of farms	12705	Acres in I-V farms 1914501	
Acres in farms	2339630	Cropland I-V farms 1303462	
Cropland in farms	1513656	Harvested cropland	
Harvested cropland in farms	990426	I-V farms 909860	

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	208306	35778	4587	40365
GRAINS	172241	20132	505	20637
Wheat	52336	6795	241	7036
Oats	104338	12068	221	12289
Barley	6344	731	32	763
Rye	2901	219	7	226
OTHER FIELD CROPS	47013	12353	182	12535
Soybeans	1606	154	8	162
Potatoes	8345	5767	li li	5771
Sugar beets				
Field beans	9383	47		47
HAY OR GRASS SILAGE	388835	6479	355	6834
PASTURED CROPLAND	298775	2691	136	2827
Cropland used for pasture	242536	1985	102	2087
Improved pasture	56239	706	34	740
VEGETABLES, SWEET CORN, MELONS	45358	13621	413	14034
ORCHARDS	44979	6912	495	7407
BERRIES	487	101	1	102
NURSERY & GREENHOUSE PRODUCTS	947	113	14	117
OTHER CROPS	798	120	5	125
Total Fertilizer Used, Tons		98347	6683	105030
Percent of Fertilizer Used		94	6	100

TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

		20000000	APPLIED				
Item	Tons	_	Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	156646	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Total	11790	1972			93608		
Primary Nutrients in Fertilizer 65690		Ton	nages for Oth	er Recent Yea	rs		
Nitrogen	20366						
Phosphorus	24304						
Potash	21020						

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	85190	
Total Est	imated Tons Applied on All H	ighways in 1972-73,

	THE RESERVE THE PERSON NAMED IN			pplied on	and the same of the same		
Table 1	Herbicide 12956.2	es	Inse 12744.	cticides 2	Fu 11727	ngicides .5	Total 37437.9
Manure: K	ind of		Tons	of Materia	ls in W	et Manure I	efecated
Livesto		- 1	Manure	Nitrog	en	Phosphorus	Potash
Swine: Ta	ble 2	3158	1	158		44	120
Cattle: T		3930	237	22009		3930	19651
Sheep: Ta		4610	9	646		97 461	461
Horses: Table 4		460834		3180		461	2765
			4	1456		373	327
Turkeys:		4468				18	
Total from	Livestock,	4566	593	27519		4923	23340
Fertilizer	s:	Tor	ns of Ca	ommercial :	Fertili:	zers Applie	d
				Pr.	imary N	utrients	
It	em	Tot	tal	Nitrogen	P	hosphorus	Potash
Applied on Table 7	Cropland:	1684	36	20366		24304	21020

Table 8 93608

Salts: Applied on all highways, tons: Table 9 123561

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime and	Highway	De-Icing	Compounds
DI ANNITHE ADDA	. Take	Ontanio	6.0	CTATE.	New Yo	mic	

PLANNING SUBAREA:	Central 5.2	COUNTY:	Cayuga	

TABLE 1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS,	1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	47700	1311.7	10600	159.0		
Grains	16422	82.1	5474	54.7		
Hay or Grass Silage	14736	147.3	12280	122.8		
Pastured Cropland	6432	64.3	6432	64.3		
Other Field Crops	971	26.7	819	92.5	803	120.5
Vegetables	3866	130.2	3866	148.4	3866	172.2
Orchards	7.10.100	2000				
Berries	468	23.3	568	82.3	574	143.8
Nursery, Greenhouse		1				
Other Crops						
						LaC c
Totals	90595	1785.6		724.0	5253	436.5
Total Herbicides, In	secticide	s, rungio	rides: 10	0 1bs	135877	2946.1

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	3041	334	315	649
1969	3684	258	31.7	575
1972	3537	293	259	552

1972 3537	293	259	776	
Wet Manure Factor	Tons per lit	ter farrowed	7.23	
Wet Manure Defeca			3991	THE PARTY OF
Nutrients in Wet	Manure: Nitrog	en, tons	20	
	Phosph	orus, tons	6	
	Potash	, tons	15	

#### TABLE 3-MANURE FROM CATTLE

		Number Cattle	Number Cattle and Calves			
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	44895	26240	18655			
1969	41791	23719	18072			
1972	42046	24431	17615			
Wet Manure Per Anii	Factor: Tons	13.14	6.45			
Wet Manure Tons, 19	Defecated:	321023	113617			
	Defecated: Tons, 19		1640			
Nutrients	in Wet Manure: Nitr					
		phorus, tons 43' sh, tons 21				

# TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	3885	
1969	2425	897
1972	2304	3418
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	3709	43682
Nutrients in Wet Manure: Nitrogen, Tons	52	301
Phosphorus, Tons	8	44
Potash, Tons	37	262

#### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys
1964 1969 1972	313175 372726 339181		
Wet Manure Factor: Lbs. per bird Wet Manure Defecated: Tons, 1972	82.9		
Nutrients in Wet Manure:     Nitrogen, tons     Phosphorus, tons     Potash, tons	219 56 49	Combined	

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres	(1) 446784	Number I-V farms	948
Number of farms	1495	Acres in I-V farms	231617
Acres in farms	277954	Cropland I-V farms	165875
Cropland in farms	191112	Harvested cropland	
Harvested cropland in far	ms 131210	I-V farms	121772

	Crop	Tons	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total		
CORN	35207	6077	1102	7179		
GRAINS	27370	3380	182	3562		
Wheat	8705	1216	87	1303		
Oats	15829	1879	73	1952		
Barley	1655	209	17	226		
Rye	268	51	5	26		
OTHER FIELD CROPS	9870	2393	78	2471		
Soybeans	102	13	6	19		
Potatoes	1104	940	0	940		
Sugar beets						
Field beans	375	2	0	2		
HAY OR GRASS SILAGE	44474	876	109	985		
PASTURED CROPLAND	24224	266	45	311		
Cropland used for pasture	20920	244	29	273		
Improved pasture	3304	22	16	38		
VEGETABLES, SWEET CORN, MELONS	4407	992	49	1041		
ORCHARDS	568	53	1	54		
BERRIES	1	0	0	0		
NURSERY & GREENHOUSE PRODUCTS	32	1	0	1		
OTHER CROPS	11	1	1	2		
Total Fertilizer Used, Tons		14041	1567	15608		
Percent of Fertilizer Used		90	10	100		

TABLE 7FERTILIZER	ISED IN 197	2 TABLE	APPLIED	MESTONE EQUIV	ALENT
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	23322	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1755	1972			6899
Total	25077		magan for Oth	er Recent Yes	
Primary Nutrients in Fertilizer	9780	100	inages for our	IEI NECEILE VEE	
Nitrogen	3032			10000	
Phosphorus	3619				
Potash	3129	-			

# TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	5150	
Total Est	imated Tons Applied on All Hi	ghways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide				Fungicides		Total	
Table 1	1785.6	724.0		436	.5	2946.1		
Manure: K	ind of	1,5	Tons o	f Material	s in	Wet Manure I	efecated	
Livesto	ck	Mar	nure	Nitroge	n	Phosphorus	Potash	
Swine: Ta	wine: Table 2		3991			6	5	
Cattle: T	able 3	434640		2434		435	2173	
Sheep: Table 4		3709		52		8	37	
Horses: Table 4		43682	43682			144	262	
Chickens:		14059	14059 2.			56	49	
Turkevs:		0		0		0	0	
	Livestock,	500081	00081 3026		549		2526	
Fertilizer	s:	Tons	of Co	mmercial H	ertil	izers Applie	d	
				Pri	mary	Nutrients		
It	em	Tota	1	Nitrogen		Phosphorus	Potasi	
Applied on Table 7	Cropland:	25077		3032	3	3619	3129	

6899

Salts: Applied on all highways, tons: Table 9 7470

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

PLANNING AREA: Lake Ontario 5.0

STATE: New York

PLANNING SUBAREA: Central 5.2

COUNTY: Herkimer

Herbicides		Insect	icides	Fungicides	
Acres Treated	200000000000000000000000000000000000000	A CONTRACTOR OF THE PARTY OF TH			
12870	353.9	2860	42.9		
3797	18.9	1266	12.6		
16606	166.0	13838	138.3		
9907	99.0	9907	99.0		
41	1.2	45	5.1	45	6.7
639	21.5	639	24.5	639	28.5
54	2.7	63	12.9	65	14.0
43914	663.2	28618	335.3	749	49.2
	Acres Treated 12870 3797 16606 9907 41 639	Acres Treated 100 lbs 12870 353.9 3797 18.9 16606 166.0 9907 99.0 41 1.2 639 21.5 54 2.7	Acres Used Used Interest Inter	Acres Used Used Used 100 lbs Treated 100 lbs Treated 100 lbs 12870 353.9 2860 42.9 3797 18.9 1266 12.6 16606 166.0 13838 138.3 9907 99.0 9907 99.0 41 1.2 45 5.1 639 21.5 639 24.5 54 2.7 63 12.9	Acres Used Acres Used Acres Used Acres 100 lbs Treated 100 lbs Treated 100 lbs Treated 100 lbs Treated 12870 353.9 2860 42.9 3797 18.9 1266 12.6 16606 166.0 13838 138.3 9907 99.0 99.0 99.0 11 1.2 45 5.1 639 21.5 639 24.5 639 54 2.7 63 12.9 65

	Hog & Pig	Number So	Number Sows Farrowing			
Year Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total			
1964	633	34	58	92		
1969	187	43	23	66		
1972	180	33	31	64		

Wet Manure Factor: Tons per litter farrowed
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	52953	35072	17881			
1969	41738	26946	14792			
1972	47765	27754	20011			
Wet Manur Per Ani	e Factor: Tons	13,14	6.45			
Wet Manur Tons, 1	e Defecated; 972	364688	129071			
	e Defecated: Tons, 1972 in Wet Manure: Nitroge	en, tons 2765	9			
	Phospho	orus, tons 494 tons 2469				

TABLE 4-MANURE FROM SHEE	tem	Sheep & Lambs	Horses & Ponies	
1964		248		
1969		294	515 1962	
1972		280	1962	
Wet Manure Factor: Tons	per animal	1.61	12.78	
Wet Manure Defecated: To		451	25074	
Nutrients in Wet Manure:		6	173	
	Phosphorus, Tons	1	173 25 150	
	Potash Tons	5	150	

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised	
1964	51265			
1969	37894			
1972	34484			
Wet Manure Factor: Lbs. per bird	82.9			
Wet Manure Defecated: Tons, 1972	1429			
Nutrients in Wet Manure: Nitrogen, tons	22	Combined		
Phosphorus, tons	6			
Potash, tons	5			

TABLE 6-CROP ACREACES & PERTILIZER HISER-CLASS I-V CENSUS FARMS, 1969

918208	Number I-V farms	729
885	Acres in I-V farms	175090
197903	Cropland I-V farms	108226
121289	Harvested cropland	
74210	I-V farms	70448
	885 197903 121289	885 Acres in I-V farms 197903 Cropland I-V farms 121289 Harvested cropland

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	11487	1640	138	1778
GRAINS	6328	507	14	511
Wheat	158	16	1	17
Oats	6024	479	3	482
Barley	83	4	0	4
Rye	0	0	0	0
OTHER FIELD CROPS	60	60	0	60
Soybeans				
Potatoes	60	60	0	60
Sugar beets				
Field beans	11	2	0	5
HAY OR GRASS SILAGE	51993	594	21	615
PASTURED CROPLAND	43986	257	10	267
Cropland used for pasture	32275	172	0	172
Improved pasture	11711	85	10	95
VEGETABLES, SWEET CORN, MELONS	729	82	9	91
ORCHARDS	67	3	0	3
BERRIES	14	0	0	0
NURSERY & GREENHOUSE PRODUCTS	4	10	0	U
OTHER CROPS	0	0 -	0	0
Total Fertilizer Used, Tons		3145	182	3327
Percent of Fertilizer Used		95	5	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED						
Item	Tons	_	Tonnage	Tonnage not					
Fertilizer Used on Crops: Solid	4982	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage				
Liquid	375	1972			8123				
Total 5357		Tonnages for Other Recent Years							
Primary Nutrients in Fertilizer	2089	100	nagus tor sun						
Nitrogen	648				-				
Phosphorus	773								
Potash	668								

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2900	
Total Est	imated Tons Applied on All Hi	ghways in 1972-73,

	Herbicide	es I	nsecticides		Total		
Table 1	663.2	335.	3	149.2	1047.7		
Manure: Ki	nd of	Tons of Materials in Wet Manure Defecated					
Livestod		Manu	re Nitrog	gen Phosphoru			
Swine: Tab		463	2	1	2		
	Cattle: Table 3		2765	494	2469		
		451	6	1	5		
Horses: Ta		25074	173	25	150		
Chickens:	Table 5	1429	22	6	5		
Turkeys: T		0	0	0	0		
Total from Ton	Livestock,	521176	2968	527	2631		
Fertilizers	:	Tons o		Fertilizers Appl	1ed		
Ite	m	Total	Nitrogen		Potasi		
Applied on Table 7		5357	648	773	668		

Salts: Applied on all highways, tons: Table 9 4206

To Convert From Pounds (1b)

Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
						221 2		

PLANNING AREA:	Lake Ontario 5.0	STATE:	New York
PLANNING SUBAREA:	Central 5.2	COUNTY:	Madison

	Herbi	cides	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	28350	779.6	6300	94.5		
Grains	6821	34.1	2274	22.7		
Hay or Grass Silage	16815	168.1	14013	140.1		
Pastured Cropland	8394	83.9	8394	83.9		
Other Field Crops	890	26.5	973	111.8	972	145.8
Vegetables	751	25.3	751	28.8	751	33.4
Orchards						
Berries	148	7.5	170	25.1	172	48.3
Nursery, Greenhouse						
Other Crops						
				20/10	\$0.0e	207 5
Totals Total Herbicides, In	62169	1125.0		506.9	1895 96939	227.5 1859.4

TABLE 2-MANURE FROM SWINE

Hog & Pig		Number Son		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	524	22	35	57
1969	331	19	21	40
1972	318	20	1.8	38

Wet Manure Factor: Tons per litter farrowed Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	61050	38701	22349
1969	53674	33067	20607
1972	58616	34059	24557
Wet Manure Per Anim	Factor: Tons	13,14	6.45
Wet Manure Tons, 19	Defecated: 72	447535	158393
Wet Manure	Defecated: Tons, 1972	Combined:	605928
Nutrients	in Wet Manure: Nitrog	en, tons	3393
			606
	Potash	, tons	3030

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	578	
1969	1059	865
1972	1006	3296
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1620	42123
Nutrients in Wet Manure: Nitrogen, Tons	23	291
Phosphorus, Tons	3	42
Potash, Tons	16	253

TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised	
1964	122825			
1969	115091			
1972	104733			
Wet Manure Factor: Lbs. per bird	82.9			
Wet Manure Defecated: Tons, 1972	4341			
Nutrients in Wet Manure: Nitrogen, tons	68	Combined		
Phosphorus, tons	17			
Potash, tons	15			

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	422784	Number I-V farms	811
Number of farms	1075	Acres in I-V farms	210814
Acres in farms	236010	Cropland I-V farms	129660
Cropland in farms	141314	Harvested cropland	
Harvested cropland in farms	96319	I-V farms_	91066

	Crop	Tons o	of Fertilize	r Used	
Crops	Acres	Dry	Liquid	Total	
CORN	24637	4032	300	4332	
GRAINS	11369	1270	4	1274	
Wheat	401	57	0	57	
Oats	10565	1175	4	1179	
Barley	171	20	0	50	
Rye	13	1	0	1	
OTHER FIELD CROPS	2483	1043	11	1054	
Soybeans	12	1	0	1	
Potatoes	1340	836	0	836	
Sugar beets					
Field beans	A CONTRACTOR OF THE PARTY OF TH		-		
HAY OR GRASS SILAGE	51978	766	59	825	
PASTURED CROPLAND	40508	282	3	285	
Cropland used for pasture	30562	137	3	140	
Improved pasture	9946	145	0	145	
VEGETABLES, SWEET CORN, MELONS	852	366	3	369	
ORCHARDS	130	16	0	16	
BERRIES	2	0	0	0	
NURSERY & GREENHOUSE PRODUCTS	5	0	0	0	
OTHER CROPS	13	0	0	0	
Total Fertilizer Used, Tons		7775	380	8155	
Percent of Fertilizer Used		95	5	100	

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

TABLE /FERTILIZER USED IN 1972		APPLIED						
Item	Tons		Tonnage	Tonnage not				
Fertilizer Used on Crops: Solid	12203	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage			
Liquid	919	1972			12061			
Total	13122	Tonnages for Other Recent Years						
Primary Nutrients in Fertilizer	5117	101	mages roz ou					
Nitrogen	1586				-			
Phosphorus	1893							
Potash	1638							

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile		
1970-71				
1971-72				
1972-73	4200			
1972-73	4200 ated Tons Applied on All H	ighways in 1972-73,		

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide 1125.0	s In 506	secticides .9	Fungicides 227.5	Total 1859.4
Manure: K	ind of	Ton	s of Material	ls in Wet Manure	Defecated
Livesto		Manur	e Nitroge	en Phosphorus	Potash
Swine: Ta		275	1	0	1
Cattle: T		605928	3393	606	3030
Sheep: Ta		1620	23	3	16
Horses: Table 4		42123		42	253
Chickens: Table 5		4341	291 68	17	15
Turkeys: Table 5		0	0	0	0
	Livestock,	654287	3776	668	3315
Fertilizer	s:	Tons of	Commercial	Fertilizers Appli	ed
1010011001				imary Nutrients	-0-
It	em	Total	Nitrogen	Phosphorus	Potasi
	Cropland:	13122	1586	1893	1638
	estone equiva		ased or appl	ied, tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg)

Multiply By 0.453 907.2

PLANNING AREA: Lake Ontario 5.0 STATE: New York PLANNING SUBAREA: Central 5.2 COUNTY: Oneida

MARKET	1 POTTMATED	AMOUNTER	OF	CHEMICALS	TISETS	CONT	CRAPC	1972	

	Herbicides		Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 1bs
Corn	29790	819.2	6620	99.3		
Grains	7128	35.6	2376	23.7		
Hay or Grass Silage	21945	219.4	18287	182.8		
Pastured Cropland	15806	158.0	15806	158.0		
Other Field Crops	485	14.1	488	55.8	485	72.8
Vegetables	4484	151.1	4484	172.1	4484	199.7
Orchards						
Berries	188	9.6	215	36.7	220	55.5
Nursery, Greenhouse						
Other Crops						
W	79826	1407.0	\Dog/	728.4	5189	328.0
Totals Total Herbicides, In			48276	0 1bs	133291	2463.4

#### TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	2008	133	177	310
1969	1562	193	102	295
1972	1500	150	133	283

Wet Manure Pactor: Tons per litter farrowe
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons\_
Phosphorus, tons\_ Potash, tons\_

# TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves					
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	79785	51354	28431				
1969	68792	41235	27557				
1972	73094	42472	30622				
Wet Manure Per Anim		13.14	6,45				
Wet Manure Defecated: Tons, 1972		558082	197512				
	Defecated: Tons, 1972		594				
Nutrients	in Wet Manure: Nitrog Phosph	orus, tons 756					
	Potash	. tons 377	8				

#### TABLE 4 .-- MANURE FROM SHEEP AND HORSES

TABLE 4 MANUKE FROM SHEET			
Year Item		Sheep & Lambs	Horses & Ponies
1964		423	
1969		167	1173
1972		160	4469
Wet Manure Factor: Tons pe	er animal	1.61	12.78
Wet Manure Defecated: Tons		258	57114
Nutrients in Wet Manure: 1		4	394
	Phosphorus, Tons	1	57
	Potash, Tons	3	343

# TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	137415		
1969	162076		
1972	147500		
Wet Manure Factor: Lbs. per bird	82.90		
Wet Manure Defecated: Tons, 1972	6114		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	95	-	-
Phosphorus, tons	24		
Potash, tons	21	-	

782976	Number I-V farms	1155
1626	Acres in I-V farms	270378
319806	Cropland I-V farms	165786
192088	Harvested cropland	
115728	I-V farms	105481
	1626 319806 192088	1626         Acres in I-V farms           319806         Cropland I-V farms           192088         Harvested cropland

	Crop	Tons of Fertilizer Used				
Crops	Acres	Dry	Liquid	Total		
CORN	23125	4134	297	4431		
GRAINS	11880	1442	7	1449		
Wheat	986	124	0	124		
Oats	10261	1262	6	1268		
Barley	383	28	0	28		
Rye	53	6	0	6		
OTHER FIELD CROPS	1340	844	0	844		
Soybeans	20	1	0	1		
Potatoes	666	663	0	663		
Sugar beets						
Field beans	63	3	0	3		
HAY OR GRASS SILAGE	64599	1137	20	1157		
PASTURED CROPLAND	64510	513	14	517		
Cropland used for pasture	51027	333	2	335		
Improved pasture	13483	180	2	182		
VEGETABLES, SWEET CORN, MELONS	5073	1016	1	1017		
ORCHARDS	200	26	0	26		
BERRIES	1	0	0	0		
NURSERY & GREENHOUSE PRODUCTS	8	1	1	2		
OTHER CROPS	129	16	0	16		
Total Fertilizer Used, Tons		9132	330	9462		
Percant of Fertilizer Used		97	3	100		

		APPLIED						
Item	Tons		Tonnage	Tonnage not				
Fertilizer Used on Crops: Solid	14121	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage			
Liquid	1063	1972			19324			
Total	15184		manage for Oth	er Recent Yes				
Primary Nutrients in Fertilizer	5922	101	mages for our	CI INCOME TO				
Nitrogen	1836							
Phosphorus	2191							
Potash	1895							

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	10100	
Total Est As Com	imated Tons Applied on All Hi puted 14649	ghways in 1972-73,

# TABLE 10 SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table I	Herbicide	les Insec 728.4		cticides 32		Fungicides .0	Total 2463.4
Manure: Ki			Tons o	f Material		Wet Manure	
Swine: Tab		2046		1.0		3	8
Cattle: Ta		75559	+	4231		756	3778
Sheep: Tal		258		4		1	3
Horses: Table 4		57114		394		57	343
Chickens: Table 5		6114		95		24	21
Turkeys: Table 5		0		0		0	0
Total from Livestock,		821126		4734		841	4153
Fertilizer	g :	Tons	of Co	mmercial 1	Ferti:	lizers Appli	ed
retrition				Pri	imary	Nutrients	
It	em	Tota	1	Nitrogen		Phosphorus	Potas
Applied on Cropland: Table 7		15184		1836		2191	1895
Lime: Lim	estone equiv	alent pu	irchase	d or appli	ied,	tons:	

To Convert From Pounds (1b)

Kilograms (kg) Hectare (ha) Kilograms (kg) Acres (acre) Tons (ton)

Multiply By 0.453 907.2

Agricultural Chem	icals	, Manures	, Fertilizers,	Lime and	Highway De-Icing	Compounds
PLANNING AREA:	Lake	Ontario	5.0	STATE:	New York	
PLANNING SUBAREA:		Central	5.2	COUNTY:	Onondaga	

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS,	1972

	Herbicides		Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	30600	841.5	6800	102.0		
Grains	10526	52.6	3509	35.0		-
Hay or Grass Silage	12808	128.0	10673	106.7		
Pastured Cropland	6328	63.2	6328	63.2		
Other Field Crops	159	4.5	152	17.3	150	22.5
Vegetables	2856	96.2	2856	109.6	2856	127.2
Orchards						
Berries	1050	59.0	1168	138.1	1181	349.4
Nursery, Greenhouse						
Other Crops						
					1-0-	
Totals	64327	1245.0		571.9	4187	499.1
Total Herbicides, In	nsecticide	s, Fungio	cides: 10	00 lbs	100000	2316.0

TARLE	2MANURE	FROM	SWINE

	Hog & Pig		ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1794	150	135	285
1969	1827	182	184	366
1972	1754	186	165	351
Wet Manu		ons per litter f	arrowed 7	.23 538
		re: Nitrogen, to		3
		Phosphorus,		
		Potach ton	e l	0

# TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves					
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	40841	24601	16240				
1969	35634	20361.	15237				
1972	36093	20972	15121				
Wet Manur	e Factor: Tons	13,14	6.45				
Wet Manur	e Defecated: 972	275572	97530				
	e Defecated: Tons, 197	gen, tons	373102 2089 373				
			1866				

# TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1676	
1969	1335	1434
1972	1080	5464
Wet Manure Factor: Tons per animal	i.61	12.78
Wet Manure Defecated: Tons, 1972	1739	69830
Nutrients in Wet Manure: Nitrogen, Tons	24	482
Phosphorus, Tons	4	70
Potash, Tons	17	419

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964 1969	230025		
1972	189713 172640	7000	70000
Wet Manure Factor: Lbs. per bird Wet Manure Defecated: Tons, 1972	82.9 7156	365.0	89.63
Nutrients in Wet Manure: Nitrogen, tons Phosphorus, tons Potash, tons	112 29 25	Combined	4399 69 18 15

# TABLE 6-CROP ACREAGES 6 FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	507840	Number I-V farms	713
Number of farms	1159	Acres in I-V farms	163773
Acres in farms	204966	Cropland I-V farms_	118986
Cropland in farms	141119	Harvested cropland	
Harvested cropland in farms	93489	I-V farms_	85423

	Crop	Tons of Fertilizer Used			
Crops	Acres	Dry	Liquid	Total	
CORN	23727	4028	700	4728	
GRAINS	17544	2058	71	2129	
Wheat	4480	574	22	596	
Oats	12336	1400	48	1448	
Barley	441	61	1	62	
Rye	215	14	0	14	
OTHER FIELD CROPS	1690	383	9	392	
Soybeans	19	0	0	0	
Potatoes	187	148	0	148	
Sugar beets					
Field beans	105	0	0	0	
HAY OR GRASS SILAGE	37620	762	40	802	
PASTURED CROPLAND	23530	225	2	227	
Cropland used for pasture	20038	184	2	186	
Improved pasture	3492	41	0	41	
VEGETABLES, SWEET CORN, MELONS	3167	892	3	895	
ORCHARDS	1507	178	0	178	
BERRIES	113	43	0	43	
NURSERY & GREENHOUSE PRODUCTS	161	7	1	8	
OTHER CROPS	123	28	14	32	
Total Fertilizer Used, Tons		8604	830	9434	
Percent of Fertilizer Used		91	9	100	

# TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

			APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	14097	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1061	1972			6480
Total	15158		magage for Oth	er Recent Yea	TS
Primary Nutrients in Fertilizer	5912	101	mages for our	let lacent roo	
Nitrogen	1833				
Phosphorus	2187				
Potash	1892				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	20000	
Total Esti As Comp	mated Tons Applied on All I	Highways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	s Ins	ecticides	Fungicides	Total
Table 1	245.0	571.	9	499.1	2316.0
Manure: Kind	of	Tons	of Material	Is in Wet Manure	Defecated
Livestock	1000	Manure	Nitroge	en Phosphorus	Potash
Swine: Table	2	2538	13	4	10
Cattle: Table		373102	2089	373	1866
		1739	24	4	17
Horses: Table		69830	482	70	419
Chickens: Tal		7156	112	29	25
Turkeys: Tab		4399	69	18	15
Total from Livestock,		458764	2789	498	2352
Fertilizers:		Tons of		Fertilizers Appli	ed
			Pri	imary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potasi
Applied on Cr	opland:	15158	1833	21.87	1892

Lime: Limestone equivalent purchased or applied, tons: Table 8 6480

Salts: Applied on all highways, tons: Table 9 29008

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

The state of the s	The second second second			1117-1-12		The second second		
Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds

PLANNING		Lake Ontario 5.0	STATE:	New York	Him
PLANNING	SUBAREA:	Central 5.2	COUNTY:	Ontario	

TABLE 1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED ON	CROPS,	1972
	He	rbi	cides	Insect	icides	Fun

	Herbi	cides	Insect	cicides	Fungi	cides
Crop Group or Grops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used	Acres	Amount Used
Corn	33300	915.7	7400	111.0		
Grains	17371	86.8	5790	57.9		
Hay or Grass Silage	11484	114.8	9570	95.7		
Pastured Cropland	4944	49.4	4944	49.4		
Other Field Crops	326	7.6-	134	13.9	120	18.0
Vegetables	9291	313.0	9291	356.6	9291	413.7
Orchards						
Berries	1781	83.3	1990	830.2	2177	384.6
Nursery, Greenhouse						
Other Crops						
Totals	78497	1570.6		1514.7	11588	816.3
Total Herbicides, In	secticide	s. Fungic	ides: 10	0 lbs	129204	3901.6

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	4056	367	362	729
1969	3171	194	191	385
1972	3050	195	175	370

Wet Manure Factor: Tons per litter larrowe
Wet Manure Defecated: Tons, 1972
Nutrients in Wet Manure: Nitrogen, tons
Phosphorus, tons
Potash, tons

# TABLE 3-MANUER FROM CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	34716	18248	16468
1969	29003	13840	15163
1972	24533	14255	10278
Wet Manure Per Anim		13.14	6.45
Wet Manure Tons, 19	Defecated: 72	187311	66293
	Defecated: Tons, l	972 Combined: 253	3604
MULLIERLES		osphorus, tons 254	
		tash, tons 126	

# TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	10273	
1969	8854	1424
1972	8411	7500
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	13542	95850 661
Nutrients in Wet Manure: Nitrogen, Tons	190	661
Phosphorus, Tons	28	96
Potash, Tons	135	575

### TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	283575		
1969	361319		
1972	328800	50	500
Wet Manure Factor: Lbs. per bird	82.9	365.0	89.63
Wet Manure Defecated: Tons, 1972	13629		
Nutrients in Wet Manure: Nitrogen, tons	213	Combined	31
Phosphorus, tons	55		0
Potash, tons	48		0

# TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	416512	Number I-V farms	790
Number of farms	1364	Acres in I-V farms	193003
Acres in farms	242716	Cropland I-V farms	149626
Cropland in farms	178129	Harvested cropland	
Harvested cropland in farms	124952	I-V farms	114237

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Total
CORN	26513	5000	490	5490
GRAINS	28952	3443	52	3495
Wheat	14084	1764	50	1814
Oats	12620	1490	1	1491
Barley	1027	132	1	133
Rye	625	36	0	36
OTHER FIELD CROPS	12243	2192	17	2209
Soybeans	140	21	0	21
Potatoes	153	162	0	162
Sugar beets				
Field beans	2073	5	0	5
HAY OR GRASS SILAGE	33090	563	0	563
PASTURED CROPLAND	16471	150	5	155
Cropland used for pasture	14356	140	5	145
Improved pasture	2115	10	0	10
VEGETABLES, SWEET CORN, MELONS	10791	3384	270	3654
ORCHARDS	2036	448	6	454
BERRIES	112	20	0	20
NURSERY & GREENHOUSE PRODUCTS	246	32	0	32
OTHER CROPS	189	35	0	35
Total Fertilizer Used, Tons		15272	840	16112
Percant of Fertilizer Used		95	5	100

TABLE 7FERTILIZER	3355 14 1776	INDIA	APPLIED	MESTONE EQUIV	
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	23927	Year	Covernment Cost/Shared	Cost/Shared	Total Tonnage
Liquid	1801	1972			3278
Total	25728		nages for Orb	er Recent Yea	
Primary Nutrients in Fertilizer	10034	101	mages rot out	I III COLLE ACC	
Nitrogen	3111	_			
Phosphorus	3713				
Potash	3210				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	5910	
Total Esti	mated Tons Applied on All H uted 8572	ighways in 1972-73,

# OF ACRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides 1570.6	1514.7		Fungicides 816.3	3901.6
	id of	Tons o	f Material	s in Wet Manure D	efecated
Livestock		Manure	Nitroger	Phosphorus	Potash
Swine: Tabl		2675	13	4	10
Cattle: Tab		253604	1420	254	1268
Sheep: Tabl		13542	190	28	135
Horses: Tab		95850	661	96	575
Chickens: 7		13629	213	55	48
Turkeys: Ta	ble 5	31.	0	0	0
Total from 1 Tons		379331	2497	437	2036

Fertilizers:	Tons of		ry Nutrients	
Item	Total	Nitrogen	Phosphorus	Potash
Applied on Cropland: Table 7	25728	3111	3713	3210

Lime: Limestone equivalent purchased or applied, tons:

	Tunte o	2010	_			
Salts:	Applied on	all highways,	tons:	Table 9	8572	

To Convert From Pounds (1b) Acres (acre) Tons (ton)

Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

					GREAT LAK	ES BASIN MA	TERIAL	USAGE INV	ENTORY					
		A	gricultur	al Chemic	als, Manu	res, Fertil	izers,	Lime and	Highway	De-Icing	Compounds			
		P	LANNING A	REA:	Lake Ont	ario 5.0		STATE:	New Y	ork				
		P	LANNING S	UBAREA:	Centra	1 5.2		COUNTY:	Osweg	0				
ED	AMOUNTS OF	CHEMI CAL	S USED ON	CROPS, 1	972		TABL	E 6CROP	ACREAGE	S & FERT	ILIZER USED	CLASS	I-V CENS	SUS FA
	Herbi	cides	Insect	icides	Fungi	cides	COTTO	mar 7 7		(1)	617216	Mr. and a	T 11 F.	-
	Acres Treated	Amount Used 100 lbs	Acres	Amount Used	Acres	Amount Used	Numb	TY, land a er of farm s in farm	ns	res	1000	Acres	in I-V far and I-V	farms

An annual control	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	11/1/2003	Amount Used 100 lbs
Corn	9000	247.5	2000	30.0		
Crains	1885	9.4	628	6.2		
Hay or Grass Silage	9054	90.5	7545	75.4		
Pastured Cropland	6062	60.6	6062	60.6		
Other Field Crops	238	7.1	264	30.4	264	39.6
Vegetables	4625	155.8	4625	177.5	4625	206.0
Orchards						
Berries	603	34.2	768	83.5	776	171.0
Nursery, Greenhouse						
Other Crops						
Totals	31467	605.1	21892	463.6	5665	416.6
Total Herbicides, In					59024	1485.3

### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1097	89	67	156
1969	1623	154	108	262
1972	1560	135	115	250

Potash, tons

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	32502	18503	13999			
1969	25973	14417	11556			
1972	25557	14850	10707			
Wet Manure Factor: Tons Per Animal		13.14	6.45			
Wet Manure Tons, 19	Defecated: 72	195129	69060			
	Defecated: Tons, 19 in Wet Manure: Nitr		264189			
MULLIEHUS			1479			
			1321			

# TARLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	696	
1969		601
1972	491	2226
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	757	28448
Nutrients in Wet Manure: Nitrogen, Tons	11	196
Phosphorus, Tons	2	28
Potash, Tons	8	171

### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		145935		
1969		86038		
1972		78300		
Wet Manure Factor	: Lbs. per bird	82.9		
Wet Manure Defeca		3246		
Nutrients in Wet	Manure: Nitrogen, tons	51	Combined	
	Phosphorus, tons	13	-	
	Potash, tons	11		

### -- CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1) Number of farms Acres in farms Cropland in farms Harvested cropland in farms	617216 1000 161347 87216 48388	Acre	per I-V faces in I-V pland I-V vested cre	farms 12 farms 70	07 25562 0703
	Cro			of Fertilize	-
Crops	Acı	res	Dry	Liquid	Tota
CORN	6966		1230	123	1353
GRAINS	3141		399	12	411
Wheat	398		70	1	71
0ats	2516		323	11	334
Barley	15		5	0	2 4
Rye	46		4	0	
OTHER FIELD CROPS	634		357	0	357
Soybeans					
Potatoes	359		290	0	290
Sugar beets			-		
Field beans	107		0	0	0
HAY OR GRASS SILAGE	2547		356	46	402
PASTURED CROPLAND	2219		175	30	205
Cropland used for pasture	1906	+	150	30	180
Improved pasture	3131		25	0	25
VEGETABLES, SWEET CORN, MELONS	5347		2264	16	2280
ORCHARDS	1304		107	7	114
BERRIES	60		8	0	8
NURSERY & GREENHOUSE PRODUCTS	48		5	1	6
OTHER CROPS	0		0	0	0
Total Fertilizer Used, Tons			4901	235	5136
Percent of Fertilizer Used			95	5	100

#### TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

			APPLIED	THE PARTY OF THE P	100000000000000000000000000000000000000
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	7659	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	576	1972			7639
Total	8235		nagge for Oth	er Recent Yes	
Primary Nutrients in Fertilizer	3212	101	nages for our	LET MECENE TES	
Nitrogen	996				
Phosphorus	1188				
Potash	1028				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	11100	
Total Esti	mated Tons Applied on All Hi	ghways in 1972-73,

#### TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	erbicides 605.1	Ins. 463.0	ecticides 5		ngicides	Total 1485.3
Manure: Kind o	f	Tons	of Materia	ls in W	et Manure De	efecated
Livestock		Manure	Nitrog	en	Phosphorus	Potasi
Swine: Table 2	18	80	9		3	7
Cattle: Table	3 26	4189	1479		264	1321
Sheep: Table 4	75	7	11		2	8
Horses: Table	4 28	448	196		28	171
Chickens: Tabl	e 5 32	46	51		13	11
Turkeys: Table 5			0		0	0
Total from Live Tons	stock,	8448	1746		310	1518
Fertilizers:	1	ons of	Commercial	Fertili	zers Applie	1
			Pr.	imary N	utrients	
Item		Cotal	Nitrogen	P	hosphorus	Potasi
Applied on Crop Table 7		35	996		1188	1028
Lime: Limeston Table 8	e equivalent	purcha	sed or appl	ied, to	ns:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

PLANNING AREA:	Lake Ontario 5.0	STATE:	New York	
PLANNING SUBAREA:	Central 5.2	COUNTY	Schuyler	

TABLE 1ESTIMATED	AMOUNTS	OF	CHEMICALS	USED	ON	CROPS,	1972	
	Total Control of the	200	200					

	Herbi		Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs
Corn	4680	128.7	1040	15.6		
Grains	3049	15.2	1016	10.1		
Hay or Grass Silage	4216	42.1	3514	35.1		
Pastured Cropland	3506	35.0	3506	35.0		
Other Field Crops	30	.9	33	3.8	33	5.0
Vegetables	130	4.4	130	5.0	130	5.8
Orchards						
Berries	1332	54.3	1494	726.0	1653	380.0
Nursery, Greenhouse	-		- Contract	A. C. C.		20010
Other Crops						
Totals	16943	280.6	10733:	830.6	1816	390.8
Total Herbicides, In	secticide	s, Fungic	ides: 10		29492	1502.0

### TABLE 2-MANURE FROM SWINE

	Hog & Pig	Number Sows Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	617	78	51	129
1969	749	48	25	73
1972	720	37	33	70

 Wet Manure Factor: Tons per litter farrowed
 7.23

 Wet Manure Defecated: Tons, 1972
 50b

 Nutrients in Wet Manure: Nitrogen, tons
 3

 Phosphorus, tons
 1

 Potash, tons
 2

### TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves
Year Total		Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	9923	5216	4707
1969 1972	10786 7677	4331 4461	6455 3216
Wet Manure Per Anima	Factor: Tons	13.14	6.45
Wet Manure Tons, 197		58618	20743

# TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	5383	
1969	4554	381.
1972	4330	400
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	6971	5112
Nutrients in Wet Manure: Nitrogen, Tons	98	35
Phosphorus, Tons	98 15 70	5
Potash, Tons	70	31

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	152745		
1969	117690		
1972	108000		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	4477		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	70		
Phosphorus, tons	18		
Potash, tons	16		

#### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1960

COUNTY, land area, acres	211008	Number I-V farms	242
Acres in farms	87499	_ Acres in I-V farms_ Cropland I-V farms	37145
Cropland in farms	51651	Harvested cropland	31147
Harvested cropland in farms	26892	I-V farms	21677

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	3484	414	714	488
GRAINS	5082	611	12	623
Wheat	1422	191	3	194
Oats	3275	384	9	393
Barley	102	6	10	12
Rye	33	6	0	6
OTHER FIELD CROPS	377	71	2	73
Soybeans	10000			
Potatoes	37	18	0	18
Sugar beets				
Field beans	584	0	0	0
HAY OR GRASS SILAGE	10387	78	22	100
PASTURED CROPLAND	10753	47	16	63
Cropland used for pasture	9766	47	16	63
Improved pasture	987	0	0	0
VEGETABLES, SWEET CORN, MELONS	141	37	1	38
ORCHARDS	1711	280	0	280
BERRIES	15	1	0	1
NURSERY & GREENHOUSE PRODUCTS	111	8	1	9
OTHER CROPS	14	1	0	1
Total Fertilizer Used, Tons		1548	128	1676
Percent of Fertilizer Used		92	8	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

TABLE /FERTILIZER USED IN IS		72 TABLE	APPLIED	MESTURE EQUIV	WINDLE				
Item	Tons		Tonnage	Tonnage not					
Fertilizer Used on Crops: Solid	2497	Year	Government Cost/Shared	Government	Total Tonnage				
Liquid	188	1972			3291				
Total	2685		Tonnages for Other Recent Years						
Primary Nutrients in Fertilizer	1047	108	nages for our	er wecent rea	LB				
Nitrogen	325								
Phosphorus	387								
Potesh	335								

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	4000	
Total Estima As Comput	ted Tons Applied on All Hi	ghways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	es Ins	ecticides	Fungicides	Total
Table 1	280.6	830.6		390.8	1502.0
Manure: Ki	nd of	Tons	of Material	s in Wet Manure D	efecated
Livestoc	k	Manure	Nitroge	n Phosphorus	Potash
Swine: Tab	le 2	506	3	1	2
Cattle: Ta	ble 3	79361	141414	79	397
Sheep: Table 4 69		6971	98	15	70
Horses: Ta	ble 4	5112	35	5	31
Chickens:	Table 5	4477	70	18	16
Turkeys: T	able 5	0	0	0	0
Total from Ton	o management and	96427	650	118	516
Fertilizers	:	Tons of		ertilizers Applie	đ
				mary Nutrients	
Ite	m	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	2685	325	387	335

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Salts: Applied on all highways, tons: Table 9 5802

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds
--------------	------------	----------	--------------	------	-----	---------	----------	-----------

PLANNING AREA: Lake Ontario 5.0 STATE: New York COUNTY: Seneca

PLANNING SUBAREA: Central 5.2

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	18000	495.0	4000	60.0		
Grains	15480	77.4	5160	51.6		
Hay or Grass Silage	4934	49.3	4112	41.1		
Pastured Cropland	1836	18.3	1836	18.3		
Other Field Crops	2263	51.0	751	75.4	646	96.9
Vegetables	80	2.7	751 80	3.1	80	3.6
Orchards						
Berries	407	19.1	457	150.4	487	106.7
Nursery, Greenhouse						
Other Crops						
Totals	linon	712.8	16206	200.0	1213	207.2
Total Herbicides, In	43000		16396	399.9 0 1bs	60609	1319.9

#### TABLE 2--MANURE FROM SWINE

Hog & Pig			ws Farrowing		
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total	
1964	2095	156	189	345	
1969	2372	221	323	544	
1972	2275	275	250	525	
	72	ons per litter fa	arrowed 7.23		
let Man	ire Defecated:		3796		
Vet Man	ire Defecated:	Tons, 1972	3796 ons 19		

-		Number Cattle and Calves					
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	13088	6902	6186				
1969	11762	5522	6240				
1972	9792	5688	4104				
Wet Manure Per Anima	Factor: Tons	13.14	6.45				
Wet Manure Defecated: Tons, 1972		74740	26471				
		OOMO LIIGOT					

# TABLE 4-MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	2059	
1969	31.04	453
1972	2950	453 623
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	4750	7962
Nutrients in Wet Manure: Nitrogen, Tons	66	55
Phosphorus, Tons	10	8
Potash, Tons	48	48

### TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys Raised
1964		141495		
1969		141051		
1972		128500		
	r: Lbs. per bird	82.9		
Wet Manure Defec	ated: Tons, 1972	5326		
Nutrients in Wet	Nitrogen, tons	83	Combined	
	Phosphorus, tons	21		
	Potash, tons	19		

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	211200	Number I-V farms	371
Number of farms	585	Acres in I-V farms	104242
Acres in farms	122135	Cropland I-V farms	82278
Cropland in farms	94895	Harvested cropland	
Harvested cropland in farms	66981	I-V farms	61304

	Crop	Tons	Used		
Crops	Acres	Dry	Liquid	Total	
CORN	11430	1927	414	2341	
GRAINS	25800	2936	57	2993	
Wheat	7668	1010	25	1035	
Oats	12652	1559	24	1583	
Barley	1680	164	6	170	
Rye	742	72	0	72	
OTHER FIELD CROPS	6630	1375	35	1410	
Soybeans	1073	97	1	98	
Potatoes	897	480	0	480	
Sugar beets					
Field beans	3605	32	0	32	
HAY OR GRASS SILAGE	14530	378	1.0	388	
PASTURED CROPLAND	7312	175	1	176	
Cropland used for pasture	6328	113	1	114	
Improved pasture	984	62	0	62	
VEGETABLES, SWEET CORN, MELONS	81	35	2	37	
ORCHARDS	636	161	0	161	
BERRIES	9	5	0	5	
NURSERY & GREENHOUSE PRODUCTS	2	0	0	0	
OTHER CROPS	152	13	0	13	
Total Fertilizer Used, Tons		7037	159	7556	
Percent of Fertilizer Used		93	7	100	

TABLE 7-FERTILIZER	JSED IN 1972	TABLE		MESTONE EQUIV	ALENT			
Item	Tons	APPLIED		Tonnage not				
Fertilizer Used on Crops: Solid	11259	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage			
Liquid	847	1972			3727			
Total	12106	Tonnages for Other Recent Years						
Primary Nutrients in Fertilizer	4722	100	nages for oth	RECEIL 166	113			
Nitrogen	1464	-						
Phosphorus	1747							
Potash	1511							

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	2700	
Total Esti	mated Tons Applied on All Hi	ghways in 1972-73,

# TABLE 10-SUMMARY OF ACRYCHLTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicides	Inse	cticides	Fungicides	Total
Table 1	712.8	399.9		207.2	1319.9
Manure: Kind	of	Tons	of Material	s in Wet Manure	Defecated
Livestock		Manure	Nitroge	n Phosphorus	Potash
Swine: Table	2	3796	19	5	14
Cattle: Tabl	e 3	101211	567	101	506
Sheep: Table 4		4750	66	10	48
Horses: Tabl		7962	55	8	48
Chickens: Ta	ble 5	5326	83	21	19
Turkeys: Tab		0	0	0	0
Total from Li Tons		123045	790	145	635
Fertilizers:		Tons of C	ommercial F	Fertilizers Appli	ed
			Pri	mary Nutrients	
Item		Total	Nitrogen	Phosphorus	Potash
Applied on Cr Table 7	opland:	12106	1464	1747	1511

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

Salts: Applied on all highways, tons: Table 9\_\_\_

PLANNING AREA: Lake Ontario 5.0 STATE: New York

PLANNING SUBAREA: Central 5.2 COUNTY: Tompkins

TABLE	1-ESTIMATED	AMOUNTS	OF	CHEMICATE	Hern	ON	CROPC	1070	
ALEMO BALL	A SOCIALIZATION	THE OUT A	O.E.	OHERIT GATO	nam	OW	CRUPS,	1914	

	Herbicides		Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs
Corn	16830	462.8	3740	56.1		
Grains	5004	25.0	1668	16.6		
Hay or Grass Silage	7695	76.9	6412	64.1		
Pastured Cropland	3689	36.8	3689	36.8		
Other Field Crops	99	2.5	63	6.9	60	9.0
Vegetables	285	9.6	285	10.9	285	12.7
Orchards						
Berries	173	8.7	197	51.2	232	39.3
Nursery, Greenhouse						NA THE
Other Crops						
Totals	33775	622.3	16054	242.6	577	61.0

TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1476	140	147	287
1969	485	64	79	143
1972	465	74	66	140
1972 Wet Manu	465 re Factor: T	74 ons per litter f	arrowed 7.	140
	re Defecated:		10	12
Nutrients	in wet Manu	re: Nitrogen, to		
		Phosphorus, Potash, ton		

TABLE 3-MANURE FROM CATTLE

		Number Cattle and Calves				
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	24210	13505	10705			
1969	22780	12590	10190			
1972	22318	12968	9350			
Wet Manure Per Anima	Factor: Tons	13.14	6.45			
Wet Manure Tons, 197	1.0	170400	60308			
		gen, tons 1 horus, tons 2	30708 292 31 154			

TABLE 4-MANURE FROM SHEEP AND HORSES

Year I	tem	Sheep & Lambs	Horses & Ponies
1964		3784	
1969		2710	700
1972		2575	2500
Wet Manure Factor: Tons	per animal	1.61	12.78
Wet Manure Defecated: T		4146	31,950
Nutrients in Wet Manure:		58	220
	Phosphorus, Tons	9	32
	Potash, Tons	41	192

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964 1969 1972	240585 264827 241000		
Wet Manure Factor: Lbs. per bird Wet Manure Defecated: Tons, 1972 Nutrients in Wet Manure:     Nitrogen, tons     Phosphorus, tons     Potash, tons	82.9 9989 156 40 35	Combined	

TABLE 6-- CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	308544	Numb	er I-V far	ms	373	
Number of farms	669	Acre	s in I-V i	arms	95396	)
Acres in farms	135082	Crop	oland I-V i	arms	63733	
Cropland in farms	65830	Harv	rested crop	1and		
Harvested cropland in farms_	48902		I-V i	arms	45899	,
		Crop	Tons of	Fert:	llizer	Used
Crops		Acres	Dry	Liqu	aid	Total

	Crop	Tons	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	14824	2545	569	3114
GRAINS	8340	897	66	963
Wheat	1935	225	33	258
Oats	5687	623	29	652
Barley	183	21	3	24
Rye	50	5	0	5
OTHER FIELD CROPS	850	139	1	140
Soybeans	35	6	0	6
Potatoes	4	3	0	6 3
Sugar beets				
Field beans	694	0	0	0
HAY OR GRASS SILAGE	21323	405	14	419
PASTURED CROPLAND	15103	265	9	274
Cropland used for pasture	11379	185	8	193
Improved pasture	3724	80	1	81
VEGETABLES, SWEET CORN, MELONS	233	50	0	50
ORCHARDS	5	4	0	14
BERRIES	12	3.	0	3
NURSERY & GREENHOUSE PRODUCTS	2	0	0	0
OTHER CROPS	77	2	0	2
Total Fertilizer Used, Tons		4310	659	4969
Percent of Fertilizer Used		87	13	100

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

			APPLIED				
Item	Tons		Tonnage	Tonnage not			
Fertilizer Used on Crops: Solid	7415	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage		
Liquid	558	1972			8453		
Total	7973		wanne for Oak	ow Donner Van			
Primary Nutrients in		1011	nages for oth	er Recent Yea	LB		
Fertilizer	3109						
Nitrogen	964				-		
Phosphorus	1150						
Potash	995						

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72 1972-73	3930	
	rimated Tons Applied on All Hi mputed 5700	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides 622.3	242.6	nsecticides Fungici		Total 925.9
Manure: Ki	nd of	Tons	of Materials	in Wet Manure	Defecated
Livestock		Manure	Nitrogen	Phosphorus	Potash
Swine: Table 2		1012	5	1	4
Cattle: Ta	attle: Table 3		1292	231	1154
Sheep: Tab		4146	58	9	41
Horses: Ta		31950	220	32	192
Chickens:		9989	156	40	35
Turkeys: T		0	0	0	0
Total from Livestock,		277805	1731	313	1426
Fertilizers		Tons of C		rtilizers Applie	d
				ary Nutrients	1 2000
Ite		Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	7973	964	1150	995

Lime: Limestone equivalent purchased or applied, tons: Table 8 8453

Salts: Applied on all highways, tons: Table 9 5700

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms (kg) Hectare (ha) Kilograms (kg) 0.453 .4047 907.2

Agricultural Chem	icals, Manures, Fertili	zers, Lime and	Highway De-Icin	Compounds
PLANNING AREA:	Lake Ontario 5.0	STATE:	New York	
PLANNING SUBAREA:	Central 5.2	COUNTY:_	Wayne	

	Herbicides		Insect	Insecticides		Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	
Corn	20790	571.7	4620	69.3			
Grains	8565	42.8	2855	28.5			
Hay or Grass Silage	7153	71.5	5961	59.6			
Pastured Cropland	5992	59.9	5992	59.9			
Other Field Crops	2401	70.9	2549	292.4	2542	381.3	
Vegetables	8000	269.5	8000	307.0	8000	356.2	
Orchards							
Berries	20911	1008.6	24562	2664.3	24597	6318.9	
Nursery, Greenhouse	-						
Other Crops							
Totals	73812	2094.9	54539	3481.0	35139	7056.4	
Total Herbicides, In				00 1bs	163490	12632.	

TABLE 2-MANURE FROM SWINE

June 1-Nov. 30 Fall	
LHIL	Total
278	570
377	794
360	765
	377

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	27226	14574	12652
1969	24030	12509	11521
1972	22173	12884	9289
Wet Manure Per Anim	Factor: Tons	13.14	6.45
Wet Manure Tons, 19	Defecated: 72	169296	59914
	Defecated: Tons, 197	gen, tons	229210
		ohorus, tons	229

Year Item	Sheep & Lambs	Horses & Ponies
1964	1009	
1969	728	1097
1972	692	2700
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1114	34506
Nutrients in Wet Manure: Nitrogen, Tons	16	238
Phosphorus, Tons	2	35
Potash, Tons	11	207

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year I	tem	Chickens	Turkey Hens	Turkeys Raised
1964		259525		
1969		450609		
1972		410000	60	600
Wet Manure Factor: Lbs.	per bird	82.9	365.0	89.63
Wet Manure Defecated: To	ons, 1972	16995		-
Nutrients in Wet Manure:			Combined	38
Nitroge		265		1
Phospho	rus, tons	68		0
Potash,	tons	59		0

COUNTY: Wayne TABLE 6-CROP ACREAGES & FERTILIZER USED-CLASS I-V CENSUS FARMS, 1969

	791 8791	Acres in Cropland Harvested	V farms I-V farms I-V farms I cropland I-V farms	183616 137822
	Cro	To	ms of Ferti	llizer Used
Crops	Acre		y Liqu	iid Total
CORN	16119	299	7 164	3161
GRAINS	14275	181	1 9	1820
Wheat	6117	818	14	822
Oats	7387	915	5	920
Barley	349	53		53
Rye	293	19	0	19
OTHER FIELD CROPS	7695	301	5 15	3030
Soybeans	37	7	0	7
Potatoes	3479	213	7 4	2141
Sugar beets				
Field beans	509	3	0	3
HAY OR GRASS SILAGE	19950	382	0	382
PASTURED CROPLAND	20871	260		271
Cropland used for pasture	18930	224		230
Improved pasture	1941	36		41
VEGETABLES, SWEET CORN, MELONS	9316	314		3150
ORCHARDS	31360	14141	9 464	4913
BERRIES	51	11	0	11
NURSERY & GREENHOUSE PRODUCTS	319	58	0	58
OTHER CROPS	100	24	0	24
Total Fertilizer Used, Tons		161	54 669	16823

96 4

Percent of Fertilizer Used

TABLE 7FERTILIZER USED IN 1		APPLIED				
Item	Tons		Tonnage	Tonnage not		
Fertilizer Used on Crops: Solid	25056	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage	
Liquid	1886	1972			10592	
Total	26942		magan for Oth	ner Recent Yes		
Primary Nutrients in Fertilizer	10507	101	inages for our	I ALCOHE TO		
Nitrogen	3257	-			-	
Phosphorus	3888					
Potash	3362					

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS Tons Applied Per Tons Purchased Through State Year 1970-71 1971-72 1972-73 13400 Total Estimated Tons Applied on All Highways in 1972-73, As Computed 19435

Table 1	Herbicide 2094.9	s In:	secticides .0	70	Fungicides 56.4	Total 12362.3
Manure: K				le in	Wet Manure I	No fersted
Livesto	397551010.Cr	Manur			Phosphorus	
Swine: Ta		5531	28	Seen	8	21
Cattle: T		229210	1284		229	1146
Sheep: Ta		1114	16		2	11
Horses: T		34506	238		35	207
Chickens:		16995	265		35 68	59
Turkeys:		38	1		0	0
	Livestock,	287394	1832		342	1444
Fertilizer	s:	Tons of	Commercial	Ferti	lizers Applie	ed
					Nutrients	
It	em	Total	Nitroger	1	Phosphorus	Potash
Applied on Table 7	Cropland:	26942	3257		3888	3362
	estone equiva		ased or appl	lied,	tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 907.2

PLANNING AREA: Lake Ontario 5.0 STATE: New York

PLANNING SUBAREA: Central 5.2 COUNTY: Yates

TABLE	1ESTIMATED	AMOUNTS	OF	CHEMICALS	HSED	ON	CROPS.	1972	

Crops         Treated         100 lbs         Treated         100 lbs         Treated           Corn         13860         381.1         3080         46.2         48.3         48.2         48.3         48.2         48.3         48.8 </th <th></th> <th colspan="2">Herbicides</th> <th colspan="2">Insecticides</th> <th colspan="2">Fungicides</th>		Herbicides		Insecticides		Fungicides	
Grains         7296         36.4         2432         24.3           Hay or Grass Silage 4664         46.6         3887         38.8           Pastured Cropland         2508         25.0         2508         25.0           Other Field Crops         324         6.8         60         5.0         42           Vegetables         4449         149.9         4449         170.8         4449           Orchards         Berries         4760         198.3         5331         2635.2         5912           Nursery, Greenhouse         Other Crops         60 <t< th=""><th>or</th><th></th><th>Used</th><th></th><th>Used</th><th>Acres Treated</th><th>Amount Used 100 1bs</th></t<>	or		Used		Used	Acres Treated	Amount Used 100 1bs
Hay or Grass Silage 4664 46.6 3887 38.8  Pastured Cropland 2508 25.0 2508 25.0 Other Field Crops 324 6.8 60 5.0 42  Vegetables 4449 149.9 4449 170.8 4449 Orchards Berries 4760 198.3 5331 2635.2 5912  Nursery, Greenhouse Other Crops	Corn	13860	381.1	3080	46.2		
Pastured Cropland 2508 25.0 2508 25.0 Other Field Crops 324 6.8 60 5.0 42 Vegetables 41449 149.9 4449 170.8 4449 Orchards Berries 4760 198.3 5331 2635.2 5912 Nursery, Greenhouse Other Crops	Grains	7296	36.4	2432	24.3		
Other Field Crops 324 6.8 60 5.0 42 Vegetables 4449 149.9 4449 170.8 4449 Orchards Berries 4760 198.3 5331 2635.2 5912 Nursery, Greenhouse Other Crops	Hay or Grass Silage	4664	46.6	3887	38:8		
Vegetables         4449         149.9         4449         170.8         4449           Orchards         Berries         4760         198.3         5331         2635.2         5912           Nursery, Greenhouse         Other Crops         0	Pastured Cropland	2508	25.0	2508	25.0		
Orchards Berries 4760 198.3 5331 2635.2 5912 Nursery, Greenhouse Other Crops	Other Field Crops	324	6.8	60	5.0	42	6.3
Berries 4760 198.3 5331 2635.2 5912 Nursery, Greenhouse Other Crops	Vegetables	4449	149.9	4449	170.8	4449	198.1
Nursery, Greenhouse Other Crops	Orchards						
Other Crops	Berries	4760	198.3	5331	2635.2	5912	1034.5
	Nursery, Greenhouse		250,000				
	Other Crops						
Totals   37861   844.1   21747   2945.3   10403   Total Herbicides, Insecticides, Fungicides: 100 lbs   70011	Totals	37861	844.1	21747	2945.3	10403	1238.

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number So	ws Farrowing	
ear	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
964	2500	349	299	648
969	4395	436	565	1001
1972	4220	510	450	960

Wet Manure Factor: Tons per litter farrowed 7.23
Wet Manure Defecated: Tons, 1972 6941
Nutrients in Wet Manure: Nitrogen, tons 35
Phosphorus, tons 10
Potash, tons 26

# TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	13559	7216	6343
1969	11424	5945	5479
1972	10538	6123	4415
Wet Manure Per Anim	Factor: Tons	13.14	6.45
Wet Manure Tons, 19	Defecated: 72	80456	28477
	Defecated: Tons, 197 in Wet Manure: Nitro		08933
MULTIENTS			09
		h, tons 5	45

### TABLE 4--MANURE FROM SHEEP AND HORSES

	7630	
1964	1020	
	1612	349
1972	+381	1501
Wet Manure Factor: Tons per animal	1.61	12.75
Wet Manure Defecated: Tons, 1972	7053	19183
Nutrients in Wet Manure: Nitrogen, Tons	99	132
Phosphorus, Tons	99 15	19
	71	115

#### TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	124625		
1969	175014		
1972	159300		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	6603		
Nutrients in Wet Manure:		Combined	
Nitrogen, tons	103	_	
Phosphorus, tons	26		
Potash, tons	23		T- S-

### TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	219712	Number I-V farms	477
Number of farms	741	Acres in I-V farms	102967
Acres in farms	125421	Cropland I-V farms	73622
Cropland in farms	86193	Harvested cropland	
Harvested cropland in farms	56094	I-V farms	51125

	Crop	Tons o	of Fertilize	r Used
Crops	Acres	Dry	Liquid	Tota
CORN	10787	1754	216	1970
GRAINS	12160	1378	29	1407
Wheat	5982	730	15	745
Oats	5186	579	8	587
Barley	255	25	4	29
Rye	563	35 481	2	37
OTHER FIELD CROPS	3141		14	495
Soybeans	168	8	1	9
Potatoes	59	30	0	30
Sugar beets				
Field beans	1257	0	0	0
HAY OR GRASS SILAGE	13421	182	14	196
PASTURED CROPLAND	9312	76	0	76
Cropland used for pasture	7891	56	0	56
Improved pasture	1421	20	0	50
VEGETABLES, SWEET CORN, MELONS	5221	1359	53	1412
ORCHARDS	5455	1187	17	1204
BERRIES	107	10	1	11
NURSERY & GREENHOUSE PRODUCTS	9	1	0	1 0
OTHER CROPS	0	0	0	1.00
Total Fertilizer Used, Tons		6428	344	6772
Percent of Fertilizer Used		95	5	100

# TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

INDUS / FURS LIFE MAN	1000 111 117		APPLIED		
Item	Tons	-	Tonnage	Tonnage not	-
Fertilizer Used on Crops: Solid	10108	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	761	1972			3741
Total	10869		pages for Oth	er Recent Yea	
Primary Nutrients in		100	nages for our	I ACCOUNT YOU	1
Fertilizer	4239				
Nitrogen	1314				
Phosphorus	1568				
Potash	1357				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	1800	
Total Esti As Comp	mated Tons Applied on All Hi uted 2611	ghways in 1972-73,

# TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	Herbicide	s Ins	secticides	Fungicides	Total
Table 1	844.1	294	5.3	1238.9	5028.3
Manure: K	ind of	Tons	of Material	s in Wet Manure I	
Livesto		Manure	Nitroge	n Phosphorus	Potash
Swine: Ta	ble 2	6941	35	10	26
Cattle: T	able 3	108933	61.0	109	545
Sheep: Ta		7053	99	15	71
Horses: T		19183	132	19	115
Chickens:	Table 5	6603	103	26	23
Turkeys:	Table 5	0	0	0	0
Total from To	Livestock,	148713	979	179	780
Fertilizer	s:	Tons of		ertilizers Applie	d
				mary Nutrients	1
	em	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	10869	1314	1568	1356

Lime: Limestone equivalent purchased or applied, tons:
Table 8 3741

Salts: Applied on all highways, tons: Table 9 2611

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

#### 8.3.2.4 Lime

Limestone application rates have been and are likely to continue to be above Basin average. However these rates are not expected to increase. There were 84,921 metric tons (93,608 tons) of lime purchased or applied to this area in 1972.

### 8.3.2.5 Salts

Road de-icing salts applied to all highways in this planning subarea amounted to 112,095 metric tons (123,561 tons) in 1972-73. The rate of application is not likely to increase; however, if highway miles increase, total salt quantities used will increase proportionately.

# 8.4 Planning Subarea 5.3

The three counties of Planning Subarea 5.3 are at the eastern end of Lake Ontario. They are large counties covering a land area of 1.4 million hectares (3.4 million acres). Only about 162,000 hectares (400,000 acres) represent harvested cropland.

# 8.4.1 Agricultural Characteristics

These three counties are primarily dairy counties. The crops raised are primarily to support the dairy livestock program.

This represents a less intensive type of crop agriculture than is found generally throughout the entire Basin, except possibly for that found in the northern parts of the Great Lake states.

Table 8-28 indicates the relative proportions of materials usage in Planning Subarea 5.3 in comparison with the total Great Lakes Basin.

Table 8-28
MATERIALS USAGE BASIN RELATIONSHIP -- PSA 5.3 to GREAT LAKES

Per harvested acre of cropland	Planning Subarea 5.3	Great Lakes Basin
Lbs of chemicals applied Index of chemicals applied	1.19 45	2.66 100
Tons of livestock manure defecated Index of manure defecated	6.29 187	3.37 100
Lbs primary nutrients in livestoo Index primary nutrients in manure	ck manure 149 182	82 100
Lbs commercial fertilizer applied Percent liquid fertilizer applied Index commercial fertilizer applied	7	321 22 100
Lbs primary nutrients in commercial Index primary nutrients in commercial		153 100
Lbs of lime applied Index of lime applied	169 99	170 100
Per acre of total land area Lbs road salts used Index road salts used	17.43 42	41.74 100
Tons (ton) K	To ilograms (kg) ilograms (kg) etric Tons	Multiply By 0.454 907.2 0.907

# 8.4.2 Materials Usage

Table 8-29 lists by county the material usage inventory for PSA 5.3. Detailed statistics are shown on Tables 8-30 to 8-33.

Table 8-29 MATERIALS USAGE (in 1972)

PSA 5.3	Chemicals Applied to Crops (100 1bs)	Livestock Manure (tons)	Commercial Fertilizer on Cropland (tons)	Limestone Purchased or Applied (tons)	Salts Applied to all Highways (tons)
New York Jefferson	1983	927132	10582	16556	13851
Lewis	874	600468	6696	10454	5134
St. Lawrence	2046	1062013	10082	7730	10878
TOTAL	4903	2589613	27360	34740	29863
To Convert Fro	om	То		Multiply By	
Pounds (1b)		Kilograms (1	cg)	0.454	
Tons (ton)		Kilograms (1 Metric Tons	cg)	907.2 0.907	

# 8.4.2.1 Agricultural Chemicals

Chemicals used are 64 percent herbicides, 34 insecticides and only 2 percent fungicides. The herbicides are used primarily on corn and the other general farm crops. Chemicals applied in this subarea may increase some but will likely remain comparatively modest. Most of the increase will be in the herbicide class. The amounts used in 1972 were 22,400 kilograms (490,320 lbs) of agricultural chemicals.

# 8.4.2.2 Animal Wastes

Livestock production in this planning subarea is important and this is indicated by the manure index. Cattle provide 93 percent of the livestock manure, horses 6 percent and chickens 1 percent. Horse numbers which have been increasing will probably level out. Dairy numbers will probably continue to decrease some. However, manure production rates in this subarea will continue well above the average for the Basin. The 1972 manure production totalled 2,349,297 metric tons (2,589,613 tons) for this area. This represents 28 percent of the total manure produced in the Lake Ontario basin. Nitrogen, phosphorus, and potash combined comprise 1.2 percent of the total manure tonnage.

# 8.4.2.3 Commercial Fertilizers

A total of 24,820 metric tons (27,360 tons) of commercial fertilizers were applied to croplands in PSA 5.3. Of the primary nutrients in the fertilizers, nitrogen accounted for 31 percent, phosphorus 37 percent and potash 32 percent. It is projected that commercial fertilizer use will increase 5-15 percent in the next 10 years.

Agricultural (	hemicals, Manures	, Fertilizers	, Lime and	Highway	De-Icing	Compounds
PLANNING AREA:	Lake Ontari	5.0	STATE:	New	York	1 401 32

PLANNING SUBAREA:	East	5.3	COUNTY:	3 County	Totals	(New	York-3)

Crops T	Acres Treated 54000	Amount Used 100 lbs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Grains		1484.9	12000	180.0		
	20042			700.00		
Hay or Grass Silage		100.1	6681	66.7		
	98021	980.0	81684	816.7		
Pastured Cropland	56024	560.1	56024	560.1		
	292	8.8	325	37.4	325	48.8
	208	7.0	208	8.0	208	9.2
Orchards						
	78	5.1	83	14.3	87	16.0
Nursery, Greenhouse						
Other Crops						

#### TABLE 2--MANURE FROM SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	4250	332	312	644
1969	3309	345	316	661
1972	3220	338	296	634

Totals 228665 3146.0 157005 1683.2 620 Total Herbicides, Insecticides, Fungicides: 100 lbs 3866

#### TABLE 3--MANURE FROM CATTLE

		Number Cattle and Calves					
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves				
1964	241810	154589	87221				
1969	215164	132109	83055				
1972	234182	136073	98109				
Wet Manure Per Anim	Factor: Tons	13.14	6.45				
Wet Manure Tons, 19	Defecated: 72	1787999	632803				
	Defecated: Tons, 1	rogen, tons	2420802 13556				
			2421				

#### TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep &	Horses & Ponies
iear rem		ronies
1964	3702	
1969	1678	3313
1972	1597	11635
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	2571	148695
Nutrients in Wet Manure: Nitrogen, Tons	36	1026
Phosphorus, Tons	5	149
Potash, Tons	26	892

# TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year	Item	Chickens	Turkey Hens	Turkeys
1964		449828		
1969		260144		
1972		236896	5000	50000
	ctor: Lbs. per bird	82.9	365.0	89.63
Wet Manure De	fecated: Tons, 1972	9819		
Nutrients in	Nitrogen, tons	153	Combined	3142 49
	Phosphorus, tons Potash, tons	39 34		13

TABLE 6 CROP ACREAGES & FERTILIZER USEDCLASS I-V CENSUS FARMS, 196
--

COUNTY, land area, acres (1) 3425920 Number I-V farms\_

Number of farms	4728	Acres in I-		1004933
Acres in farms		Cropland I-		609195
Cropland in farms	684817	Harvested o		San all
Harvested cropland in farms	411461	I-	V farms	381895
	Cro	p Tons	of Fertili:	zer Used
Crops	Acr	es Dry	Liquid	Total
CORN	48839	7737	357	8094
GRAINS	33409	3126		3126
Wheat	893	97	33	97
Oats	31657	2953		2953
Barley	425	33		33
Rye	21	5		5
OTHER FIELD CROPS	489	248		248
Soybeans				
Potatoes	439	239		239
Sugar beets				
Field beans	700	5		5
HAY OR GRASS SILAGE	30044	1 4048	17	4065
PASTURED CROPLAND	22102	4 1309	21	1330
Cropland used for pasture	19238	1056	20	1076
Improved pasture	28640	253	1	254
VEGETABLES, SWEET CORN, MELONS	217	1414		1414
ORCHARDS	49	5		5
BERRIES	1.6			1000
NURSERY & GREENHOUSE PRODUCTS	65	1	1	2
OTHER CROPS	76			
Total Fertilizer Used, Tons		16523	396	16919

# Percent of Fertilizer Used 98 2 100 TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

ARMIDE / FURN ADALOM	-	- CASSISS	APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	25444	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	1916	1972			34740
Total	27360		sans for Oth	er Recent Yea	
Primary Nutrients in		100	mages for our	ler Recent rea	15
Fertilizer	10670				
Nitrogen	3308				
Phosphorus	3948				
Potash	3414				

# TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HICHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	20590	
Total Est	imated Tons Applied on All H puted 29863	ighways in 1972-73,

# TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicide 3146.0	es		ticides		Fungicides .0	Total
Table 1	3240.0		The second second		-	100	4903.2
Manure: K	ind of	Tons o		f Materia	ls in	Wet Manure D	
Livesto	ck		Manure	Nitrogen		Phosphorus	Potash
Swine: Tal	le 2	4584	+	23		6	17
Cattle: Ta	able 3	2420	2080	13556	5	2421	12104
Sheep: Tal		257	L	36		5	26
Horses: Table 4		148695		1026		149	892
Chickens:	Chickens: Table 5		9	153		39	34
Turkeys:		3142		49		13	11
	Livestock,	2589613		14843		2633	13084
Fertilizer	:	To	ns of Co	mmercial	Ferti	lizers Applie	d
				Pr	imary	Nutrients	
Ite	em	To	tal	Nitrogen		Phosphorus	Potash
Applied on Table 7	Cropland:	2736	50	3308		3948	3414
	estone equiv		purchase	d or appl	ied,	tons:	

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

Agricultural	Chemicals,	Manures,	Fertilizers,	Lime	and	Highway	De-Icing	Compounds

PLANNING	AREA:	Lake 0	ntario	5.0	STATE:	New York	
PLANNING	SUBAREA:	East	5.3		_ COUNTY:_	Jefferson	

TABLE 1--ESTIMATED AMOUNTS OF CHEMICALS USED ON CROPS, 1972

	Herbi	cides	Insect	icides	Fungicides	
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	24120	663.3	5360	80.4		
Grains	13061	65.3	4354	43.5		
Hay or Grass Silage	34249	342.4	28541	285.4		
Pastured Cropland	19105	191.0	19105	191.0		
Other Field Crops	275	8.3	306	35.2	306	45.9
Vegetables	32	1.1	32	1.2	32	1.4
Orchards						
Berries	53	2.9	60	12.0	62	12.9
Nursery, Greenhouse						
Other Crops						
Totals	90895	1274.3		648.7	400	60.2
Total Herbicides, In	secticide	s, Fungic	ides: 10	0 1bs	149053	1983.2

#### TABLE 2--MANURE FROM SWINE

Hog & Pig		Number Son		
Year Dec. 1	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	1163	78	99	177
1964 1969	516	35	36	71
1972	495	36	32	68

Wet Manure Factor: Tons	per litter farrowed	7.23
Wet Manure Defecated: Ton	s, 1972	492
Nutrients in Wet Manure:	Nitrogen, tons	2
	Phosphorus, tons	1
	Potash, tons	2

TABLE 3-MANURE FROM CATTLE

		Number Cattle	and Calves		
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves		
1964	85477	54306	31171		
1969	75513	46451	29062		
1972	82341	47845	34496		
Wet Manure Per Anima	Factor: Tons	13.14	6.45		
Wet Manure Defecated: Tons, 1972		628683	222499		
		en, tons 4 orus, tons 8	51182 767 51 256		

# TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1984 451 428	
1969	451	1268
1972	428	5000
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	689	63900
Nutrients in Wet Manure: Nitrogen, Tons	10	441
Phosphorus, Tons	1	64
Potash, Tons	7	383

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964 1969	264125 204860		
1972	1,86423	5000	50000
Wet Manure Factor: Lbs. per bird Wet Manure Defecated: Tons, 1972	82.9 7727	365.0	89.63
Nutrients in Wet Manure: Nitrogen, tons	121	Combined	3142 49
Phosphorus, tons Potash, tons	31 27	=	13

TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

Number of farms Acres in farms Cropland in farms	328096 1633 407526 260038 159485	Acres	land I-V	farms farms opland	1222 350329 231689
	Cro	p	Tons	of Fertiliz	er Used
Crops	Act	es	Dry	Liquid	Total
CORN	21491		3295	184	3479
GRAINS	21769		1874	0	1874
Wheat	734		84	0	84
Oats	20547	8	1754	0	1754
Barley	310		23	0	23
Rye	9 421		1	Q	1
OTHER FIELD CROPS	421		233	0	233
Soybeans					
Potatoes	421		233	0	233
Sugar beets					
Field beans	566		0	0	0
HAY OR GRASS SILAGE	10555		811	9	820
PASTURED CROPLAND	74134		125	2	127
Cropland used for pasture	66078	8	109	1	110
Improved pasture	8056		16	1	17
VEGETABLES, SWEET CORN, MELONS	28		5	0	5
ORCHARDS	48		5	0	5

TABLE 7--FERTILIZER USED IN 1972 TABLE 8--GROUND LIMESTONE EQUIVALENT

VEGETABLES, SWEET CORN, MELON:
ORCHARDS
BERRIES
BERRIES
NURSERY & GREENHOUSE PRODUCTS
OTHER CROPS
Total Fertilizer Used, Tons
Percent of Fertilizer Used

			APPLIED		
Item Tons			Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	9841	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	741	1972			16556
Total	10582	Tonnages for Other Recent Years			
Primary Nutrients in Fertilizer	4127	101	mages for our	CT NCTOIL 169	4.0
Nitrogen	1279				-
Phosphorus	1527				
Potash	1321				

TABLE 9--SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	9550	
Total Est	imated Tons Applied on All Hi puted 13851	ghways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

	ides		cticides	Fungicides	Total
Table 1 1274.3		648.7		60.2	1983.2
Manure: Kind of		Tons	of Material	s in Wet Manure 1	Defecated
Livestock	Manu		Nitroge	n Phosphorus	
Swine: Table 2		92	2	1	2
Cattle: Table 3	8	51182	4767	851	4256
Sheep: Table 4	. 6	89	10	1	7
Horses: Table 4	6	3900	441	64	383
Chickens: Table 5	7	727	121	31	27
Turkeys: Table 5	3	142	49	13	11
Total from Livestock Tons		27132	5390	961	4686
Fertilizers:		ons of C		ertilizers Applia	ed
			Pri	mary Nutrients	
Item	3	otal	Nitrogen	Phosphorus	Potash
Applied on Cropland	1	0582	1279	1527	1321

	Limestone equivalent purchased or applied, tons: Table 8 16556
Salts:	: Applied on all highways, tons: Table 9 13851

To Convert From

Pounds (1b) Acres (acre) Tons (ton) To Kilograms (kg) Hectare (ha) Kilograms (kg) 0.453 .4047 907.2

TABLE :

8-32			GREAT LAKES B	AS IN MATERIAL	USAGE INV	ENTORY	
		Agricultural Chemi	cals, Manures,	Fertilizers,	Lime and	Highway De-Icing	Compounds
		PLANNING AREA:	Lake Ontario	5.0	STATE:	New York	
		PLANNING SUBAREA:_	East 5.3		COUNTY:_	Lewis	
-ESTIMATED	AMOUNTS OF CHEMIC	CALS USED ON CROPS,	1972	TAB	LE 6CROP	ACREAGES & FERT	ILIZER USED-
	Herbicides	Insecticides	Fungicide	s com	NUTTUE Tond	(1)	826122

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs	Acres Treated	Amount Used 100 1bs
Corn	10170	279.6	2260	33.9		
Grains	3847	19.2	1282	12.8		
Hay or Grass Silage	17477	174.7	14704	145.6		
Pastured Cropland	9966	99.6	9966	99.6		
Other Field Crops	8	.2	9	1.0	9	1.4
Vegetables	20	-7	20	.8	50	•9
Orchards						
Berries	16.	1.5	15	.9	16	1.7
Nursery, Greenhouse						
Other Crops						
Totals	41504	575.5	28116	294.6	45	4.0
Total Herbicides, In	secticide	s, Fungic	ides: 10	0 lbs	69665	874.1

TARIE	2-MANURE	FROM	SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	718	48	51	99
1969	261	26	17	43
1972	250	22	19	41

Wet Manure Defecated: Tons, 1972	296	-
Nutrients in Wet Manure: Nitrogen, tons	1	
Phosphorus, tons_	0	
Potash, tons	1	

TABLE	3-MANURE	FROM	CATTLE
-------	----------	------	--------

		Number Cattle	and Calves
Year	Total	Cows & Heifers Calved	Heifers, Steers, Bulls, Calves
1964	49288	34600	14688
1969	47477	31901	15576
1972	56549	32858	23691
Wet Manure Per Anima	Factor: Tons	13.14	6.45
Wet Manure Tons, 197		431754	152807
		gen, tons	584561 3274 585 2923

TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	166	
1969	46	298
1972	1414	1135
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	71	14505
Nutrients in Wet Manure: Nitrogen, Tons	1	100
Phosphorus, Tons	0	15
Potash, Tons	1	87

TABLE 5--MANURE FROM CHICKENS & TURKEYS

Year Item	Chickens	Turkey Hens	Turkeys Raised
1964	60748		
1969	27443		
1972	24973		
Wet Manure Factor: Lbs. per bir	d 82.9		
Wet Manure Defecated: Tons, 197	2 1035		
Nutrients in Wet Manure: Nitrogen, tons	16	Combined	
Phosphorus, ton	8 4		
Potash, tons	4	The state of the	

-CLASS I-V CENSUS FARMS, 1969

COUNTY, land area, acres (1)	826432	Number I-V farms	746
Number of farms	905	Acres in I-V farms	194604
Acres in farms	219117	Cropland I-V farms	112590
Cropland in farms	120236	Harvested cropland	102
Harvested cropland in farms	73988	I-V farms	70883

	Crop	Tons	of Fertilizer	Used
Crops	Acres	Dry	Liquid	Tota
CORN	9555	1602	91	1693
GRAINS	6412	739	0	739
Wheat	48	0	0	0
Oats	6141	714	0	714
Barley	55	6	0	6
Rye	0	0	0	
OTHER FIELD CROPS	56	13	0	13
Soybeans				1000
Potatoes	6	14	0	14
Sugar beets				
Field beans	30	0	0	0
HAY OR GRASS SILAGE	55472	1245	0	1245
PASTURED CROPLAND	42856	452	1	453
Cropland used for pasture	36427	335	1	336
Improved pasture	6429	117	0	117
VEGETABLES, SWEET CORN, MELONS	17	7	0	7
ORCHARDS	1		0	0
BERRIES	13	0	0	0
NURSERY & GREENHOUSE PRODUCTS	1	0.	0	0
OTHER CROPS	30	0	0	0
Total Fertilizer Used, Tons		4058	92	4150
Percent of Fertilizer Used		98	2	100

THE PART OF THE PA	7FERTILIZER USED IN 1972 TABLE 8GROUND LIMESTONE EQ APPLIED				
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	6227	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid	469	1972			10454
Total	6696		names for Oth	er Recent Yea	
Primary Nutrients in Fertilizer	2611	100	nages for our	er necent rea	1.0
Nitrogen	810		-		
Phosphorus	966				
Potash	835				

TABLE 9-SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72		
1972-73	3540	
Total Esti	mated Tons Applied on All H uted 5134	ighways in 1972-73,

TABLE 10-SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

Table 1	Herbicides 575.5		cticides	Fungicides 4.0	Total 874.1
Manure: Kir	d of	Tons	of Materials i	n Wet Manure De	fecated
Livestock		Manure		Phosphorus	Potash
Swine: Tabl		296	1	0	1
Cattle: Tal		584561	3274	585	2923
Sheep: Tab		71	1	0	1
lorses: Tal		14505	100	15	87
Chickens: '	Table 5	1035	16	14	4
furkeys: Ta	able 5	0	0	0	0
Tons		600468	3392	604	3016
Fertilizers		Tons of C	ommercial Fert	ilizers Applied	
			Primar	y Nutrients	-
Ite	n	Total	Nitrogen	Phosphorus	Potash
Applied on Table 7	Cropland:	6696	810	966	835

To Convert From

Pounds (1b) Acres (acre) Tons (ton)

To Kilograms(kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

PLANNING AREA:	Lake Ontario 5.0	STATE:	New York
PLANNING SUBAREA:	East 5.3	COUNTY:	St. Lauranna

TABLE	1ESTIMATED	AMOUNTS.	OF	CHEMICALS	HSED	ON	CROPS	1972

	Herbi	cides	Insect	icides	Fungi	cides
Crop Group or Crops	Acres Treated	Amount Used 100 1bs	Acres Treated	Amount Used 100 lbs		Amount Used 100 1bs
Corn	19710	542.0	4380	65.7		
Grains	3134	15.6	1045	10.4	Contract Con	
Hay or Grass Silage	46295	462.9	38579	385.7		
Pastured Cropland	26953	269.5	26953	269.5		
Other Field Crops	9	+3	10	1.2	10	1.5
Vegetables	156	5.2	156	6.0	156	6.9
Orchards						
Berries	9	.7	8	1,4	9	1.4
Nursery, Greenhouse						
Other Crops						
10 L	0/0//	100(0				
Totals Total Herbicides, In	96266	1296.2		739.9	175	9.8

TABLE	2MANURE	FROM	SWINE

	Hog & Pig	Number Son	ws Farrowing	
Year	Inventory Dec. 1	Dec. 1-May 31 Spring	June 1-Nov. 30 Fall	Total
1964	2369	206	162	368
1969	2577	284	263	547
1972	2475	280	245	525
	re Factor: To	ons per litter for		7.23 3796
		re: Nitrogen, to		19
		Phosphorus,		14

#### TABLE 3--MANURE FROM CATTLE

		Number Cattle and Calves				
Year Total		Cows & Heifers Calved	Heifers, Steers, Bulls, Calves			
1964	107045	65683	41362			
1969	92174	53757	38417			
1972	95292	55370	39922			
Wet Manure Per Anima	Factor: Tons	13.14	6.45			
Wet Manure Tons, 197		727562	257497			
	Defecated: Tons, 1972 n Wet Manure: Nitro Phospl	gen, tons	985095 5516 985 4925			

# TABLE 4--MANURE FROM SHEEP AND HORSES

Year Item	Sheep & Lambs	Horses & Ponies
1964	1552	
1969	1181	1747
1972	1125	5500
Wet Manure Factor: Tons per animal	1.61	12.78
Wet Manure Defecated: Tons, 1972	1811	70290
Nutrients in Wet Manure: Nitrogen, Ton	s 25	485
Phosphorus, T	ons 4	70
Potash, Tons	18	422

#### TABLE 5-MANURE FROM CHICKENS & TURKEYS

Year Irem	Chickens	Turkey Hens	Turkeys Raised
1964	124955		
1969	27841		
1972	25500		
Wet Manure Factor: Lbs. per bird	82.9		
Wet Manure Defecated: Tons, 1972	1057		
Nutrients in Wet Manure: Nitrogen, tons	16	Combined	
Phosphorus, tons Potash, tons	4		

# TABLE 6--CROP ACREAGES & FERTILIZER USED--CLASS I-V CENSUS FARMS, 1969

res in I-V farms_ ropland I-V farms	460000
rvested cropland	264916
I-V farms_	162032
	I-V farms

	Crop	Tons	of Fertilizer	Used
Crops	Acres	Dry	Liquid	Total
COEN	17793	2840	82	2922
GRAINS	5224	513	0	513
Wheat	111		0	13
Oats	4969	13 485	0	485
Barley	60	14	0	14
Rye	12	14	0	14
OTHER FIELD CROPS	12	2	0	2
Soybeans				-0
Potatoes	12	2	0	2
Sugar beets				
Field beans	104	5	0	5
HAY OR GRASS SILAGE	139418	1992	8	2000
PASTURED CROPLAND	104034	732	18	750
Cropland used for pasture	89879	612	18	630
Improved pasture	14155	120	0	120
VEGETABLES, SWEET CORN, MELONS	172	32	0	32
ORCHARDS	0	0	0	0
BERRIES	2	0	0	0
NURSERY & GREENHOUSE PRODUCTS	55	0	0	0
OTHER CROPS	10	0	0	0
Total Fertilizer Used, Tons		6116	108	6224
Percent of Fertilizer Used		98	2	100

# TABLE 7-FERTILIZER USED IN 1972 TABLE 8-GROUND LIMESTONE EQUIVALENT

		7	APPLIED		
Item	Tons		Tonnage	Tonnage not	
Fertilizer Used on Crops: Solid	9376 706	Year	Government Cost/Shared	Government Cost/Shared	Total Tonnage
Liquid		1972			7730
Total	10082		name for Oak	er Recent Yea	
Primary Nutrients in Fertilizer	3932	100	nages for oth	ier necent rea	Lin
Nitrogen	1219				
Phosphorus	1455				
Potash	1258				

# TABLE 9-- SALTS APPLIED TO FEDERAL, STATE, COUNTY, & MUNICIPAL HIGHWAYS

Year	Tons Purchased Through State	Tons Applied Per "E" Mile
1970-71		
1971-72	7500	
1972-73 Total Est	imated Tons Applied on All High	ways in 1972-73,
	puted 10878	

# TABLE 10--SUMMARY OF AGRICULTURAL MATERIALS AND HIGHWAY DE-ICING

He	Herbicides 1296.2		cticides	Fungicides	Total 2095.9
Table 1 1			9	9,8	
Manure: Kind of		Tons of Materials in Wet Manure Defecated			
Livestock		Manure	Nitrogen	Phosphorus	Potani
Swine: Table 2	31	96	19	5	24
Cattle: Table 3	90	5059	5516	985	4925
Sheep: Table 4	18	11	25	14.	18
Horses: Table 4	70	290	485	70	1422
Chickens: Table		157	16	4	14
Turkeys: Table			0	0	0
Total from Livestock, Tons		62013	6061	1068	15383
Fertilizers:	7	ons of C	commercial Fe	rtilizers Applie	d
			Primary Nutrients		
Item	1	otal	Nitrogen	Phosphorus	Pot as
Applied on Cropl Table 7	and:	082	1219	1455	1258

Salts: Applied on all highways, tons: Table 9 10878

Pounds (1b)
Acres (acre)
Tons (ton)

To Kilograms (kg) Hectare (ha) Kilograms (kg) Multiply By 0.453 .4047 907.2

# 8.4.2.4 Lime

Lime applications have been at about the same level in PSA 5.3 as the average for the entire Basin. There are few reasons that would warrent projecting much change. Figures for 1972 show 31,516 metric tons (34,740 tons) of lime were purchased or applied to croplands in PSA 5.3.

# 8.4.2.5 Salts

Road de-icing rates have been below Basin average in this subarea. Additional amounts in the future will depend more on increased road mileage rather than increases in rates per mile. The 1972-73 amounts show that 27,092 metric tons (29,863 tons) of road de-icing salts were applied to all highways in this subarea.

# Section 9

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