

# PESTICIDE USE FOR LIVESTOCK AND POULTRY PRODUCTION IN OHIO - 1979



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Pesticide Use for Livestock and Poultry  
Production in Ohio - 1979

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## Pesticide Use for Livestock and Poultry Production in Ohio-1979

### Introduction

Livestock and poultry production in Ohio accounted for approximately \$1,392,746,000 or 40.1 percent of the cash receipts from farm marketing in 1979<sup>a/</sup> and is thus considered a major and essential part of the Ohio economy. Of the total Ohio farm cash receipts in 1979 (\$3,476,122,000), dairy products accounted for 14.6 percent (\$507,779,000), cattle and calves as meat products for 11.6 percent (\$402,727,000), hogs for meat products - 8.8 percent (\$304,780,000), poultry products - 4.0 percent (\$140,012,000), and other livestock products - 1.1 percent (\$35,606,000). In relation to the rest of the United States, Ohio ranked seventh in milk production in 1979, nineteenth in beef production, fifth in swine production, thirteenth in sheep production, and eleventh in poultry production. Successful, profitable livestock and poultry production requires sound management practices which includes satisfactory pest control. Pest problems in livestock may be viewed by some as a minor concern in the overall farm management program in relation to return on the investment or in comparison to pest control in field, vegetable, and fruit crops. However, the United States Department of Agriculture (USDA) reported that the cost of control and losses in production due to livestock insects alone in 1976 was \$3,000,000,000. Thus attention does need to be diverted toward this aspect of livestock and poultry management.

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<sup>a/</sup> Ohio Agricultural Statistics 1979. May 1980. Compiled by the Ohio Crop Reporting Service USDA-SEA-ESCS in cooperation with the Ohio Agricultural Research and Development Center, the Ohio Cooperative Extension Service, and the Ohio Department of Agriculture.

Pest control in livestock production at present predominantly involves chemicals. However, there is very little information available to indicate the current use trend of pesticides by livestock producers and the subsequent essential need for current or future pesticide registrations. The pesticide registration review process, including the Rebuttable Presumption Against Registration (RPAR) utilized by the Environmental Protection Agency (EPA) for those chemicals that are of environmental, health, or public concern, necessitates the availability of benefit/use data in order to make a proper evaluation. A vital source of benefit/use data is at the actual farm management level. The information can be obtained only by contact with the farm commodity producer and thus surveys are an important tool in preparing benefit/use reports for subsequent evaluation. Several livestock production surveys involving pesticide use have been initiated recently in the North Central Region through the direction of the Regional or State Pesticide Impact Assessment Program. Surveys in Kansas<sup>b/</sup>, Indiana<sup>c/</sup>, and Nebraska<sup>d/</sup> sponsored by the Regional program were to consider the different types of livestock production operations in relation to pesticide use with the results hopefully providing data that could be extrapolated to other states with similar operations. Missouri<sup>e/</sup> conducted a beef cattle

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<sup>b/</sup>"Evaluation of Pesticide Usage by Livestock Producers in Kansas" 1980. C. W. Pitts and R. W. Huston, Department of Entomology, Kansas State University. Final Report to NCRPIAP for Project #17.

<sup>c/</sup>"Survey of Pesticide Usage by Livestock Producers in Indiana" 1980. R. E. Williams, T. L. McCain, and A. Teklahaimanot, Department of Entomology, Purdue University. Research Bulletin 964. NCRPIAP Project #18.

<sup>d/</sup>"Survey of Insecticide Use for the Control of Livestock Insects in Nebraska". J. B. Campbell. NCRPIAP Project #81 (Draft of Final Report May 1981).

<sup>e/</sup>"1980 Missouri Beef Cattle Pesticide Use Survey". L. M. English, R. D. Hall, F. G. Jones, J. E. Ross, and J. G. Gross. University of Missouri-Columbia. Extension Division Miscellaneous Publication 520, January 1981.

pesticide use survey as a state PIAP project in order to provide answers on other questions regarding production and pesticide use of particular interest to State Extension Specialists. However, none of the published reports provide data as to the actual quantity usage of the various pesticides. It was felt by scientists in Ohio that data indicating the quantity used in addition to the identity of the pesticide and the manner of use were important to provide a proper evaluation supporting the continued registration of those products. Because a survey of this type had not been conducted previously in Ohio and there was not valid data base for providing estimates, the program was initiated in 1980 to obtain usage data.

#### Procedures

Initial efforts were centered toward developing survey questionnaires for producers of beef cattle, dairy cattle, sheep, swine, poultry, and horse and pony that would be easily understood, easy to answer, and consequently, easy to interpret responses and evaluate the data. Sample questionnaires were prepared which were specific for each livestock or poultry production industry in relation to pesticide use but general in relation to personal handling patterns and pest treatment of facilities. Surveys were sent to 20 producers each in the dairy, swine, and poultry industries. On the basis of the return from this sample, the questionnaires were modified and a cover letter providing specific instructions was prepared. All survey questionnaires were similar in format with a sheet of directions, the salutation to the producers as shown with the beef cattle questionnaire, and the latter section which was common to all industries. The only

differences were in the first part of the questionnaire where pests and pesticides were listed for the specific industry (See example in Appendix I). The original plan was that the survey recipient would answer only in relation to the animal industry indicated on the first page of the survey.

Names and addresses of livestock producers in Ohio were obtained from several sources. The lists of beef, sheep, swine, and horse and pony producers were compiled mostly from mailing lists provided by County Agents and State Specialists of the Cooperative Extension Service with some additions provided by the Beef Producer Associations and cooperation from the Ohio Quarter Horse Association who mailed 750 questionnaires to members of their exclusive mailing list. The list of dairy producers was extracted from the DHIA records maintained in the Dairy Science Department at The Ohio State University. The names of poultry producers were extracted from the membership lists of the Ohio Poultry Association provided by the Poultry Department at The Ohio State University.

In March 1980, survey questionnaires with stamped return address envelopes were mailed to producers selected randomly from the lists. The selection process emphasized efforts, when mailing lists were available, to contact some producers in every county in the state. As additional names were supplied by County Agents, etc. the number of questionnaire recipients was increased, particularly for the beef and sheep areas, until it was felt that a fairly representative sample from throughout the state had been contacted. The final tally indicated that questionnaires were mailed to 1511 beef producers, 463 dairy, 320 swine, 602 sheep, 154 poultry, and 1408 horse and pony producers or owners.

During April and May a second notice, requesting assistance and with a revised, brief questionnaire attached (See Appendix II), was mailed to those who had not responded. It was not possible to send second mailings to members of the Ohio Quarter Horse Association.

Survey questionnaires that were returned were edited by personnel in the State Pesticide Impact Assessment Program office. In several cases where the interpretation of information was difficult, the producer was contacted by telephone.

### Results and Discussion

The response of livestock and poultry producers in answering the survey request is indicated in Table 1. Unfortunately in some aspects, because it created some confusion in interpreting data, but fortunate in other aspects by providing a larger response of the producers sample, many producers did not restrict their answers to the specific livestock industry indicated on the questionnaire (See Appendix I). Instead some included information on all types of livestock and/or poultry in their operation. The number of each animal type or poultry reported on the questionnaire consequently varied from a few to a large herd or flock. In such cases of multiple listings, we were able to relate the majority of the pesticide use information to the specific livestock/poultry industry through the pesticide formulation indicated, the method of application and the pest problem specified (See various sections of Appendix I).

Analysis of the data in Table 1 indicates that the percent response to the questionnaires was fair. Considering questionnaires with usable information the return from those contacted was 23.2 percent for beef, 36.9 for dairy, 25.1 for sheep, 45.6 for swine, 72.1 for poultry and

9.9 percent for horse and pony producers. However, on the basis of number of producers in the state as indicated in the Crop Reporting Service publication (Tables 2 and 3) the sample population responding was quite small. The CRS data includes all producers who reported regardless of the size of operation, many who may have only a few animals and/or do not consider the livestock industry as their major factor in farm production. A better estimate in the coverage of the survey is provided in the relationship between the animal inventories sampled in the survey versus that from the CRS publication (Table 2). With the exception of the horse and pony survey, the survey sample may be considered fairly representative of the industry.

The characterization of respondents to the survey relative to the size of operation and the inventory of animals for each size category is recorded in Tables 5 and 6 by numbers and percentage, respectively. For comparison, Table 4 provides the characterization for some of the industry according to the Ohio Crop Reporting Service statistics. The response to the surveys represented a good cross-section of the industry in relation to size of operation. However, in dairy and swine the responses to the survey may have weighted the data more toward the larger operations which may be somewhat advantageous in evaluating pesticide use. Analysis of survey returns showed a significant percentage of farmers with small diversified livestock operations, many with less than 10 animals in any particular category. In some cases one animal type was predominant in the operation but at a low number of head, but other types of animal operations were also considered significant by the farmer even if such would have very little to contribute to the state statistics for the industry.



A lot of the operators in the first size grouping of the CRS data (Table 4) fall into the category of less than 10 animals.

Approximately 68 percent of the dairy farmers used insecticides on their animals and 68 to 74 percent in the dairy barns etc. (Table 7) for control of insect pests. The predominant insect pests were flies (Table 12). The majority of swine producers, 55.6 percent, used insecticides on their animals with 41 to 67 percent treating the buildings. The major pest concerns were lice, mange, and flies. Although only one-third of the poultry producers treated the birds, 54 to 75 percent treated the buildings for insect pests (Table 7) with major insect problems being flies, mites, and lice (Table 12). This data agrees with the general tendency to attack poultry insect problems such as mites and lice at the source - the building - rather than waiting for the problem to develop on the birds. The survey results indicated a greater tendency to use insecticides for control of insects in buildings when a multi-type animal operation was reported than when a single-type animal industry was involved. Interpretation of the data also indicates a greater probability of insecticide use associated with animal confinement or semi-confinement farm management as contrasted to pasture-type arrangements. This is somewhat evident in comparing the above data with that for beef and sheep where 51 and 28 percent of the producers, respectively, treated animals for insect control but only 17-18 percent treated the buildings (Table 7). Although a larger percentage of farmers treated the buildings under a multi-type animal operation, this probably has no direct correlation to the beef and/or sheep industry alone. The major insect problems reported by beef producers were face flies, lice, and flies in general.

For sheep the major problems reported were flies followed by lice and ticks (Table 12). Almost 50 percent of the horse and pony owners reported use of insecticides on their animals with the major pest being flies and then bots and mosquitoes. However, the majority of insecticide use was associated with operators of stables or those with several animals. Very few of the survey respondents who owned one or two animals reported any significant insecticide use and the treatment of buildings was generally associated with a multi-type animal operation.

The quantities of pesticide active ingredients used by livestock and poultry farmers in Ohio in 1979 are listed in Tables 8, 9 and 10. Table 8 reports the quantities used on animals and birds only, as related by respondents to the survey, whereas Table 9 is an extrapolation from the data provided by survey respondents to the estimated total state use on livestock and poultry. The extrapolation is based upon animal numbers rather than on producers as explained previously. Table 10 shows the amount of insecticides reported used for fly control in livestock and poultry buildings as well as the extrapolated state calculation. Total insecticide use was approximately 176,883 pounds of active ingredient of which 120,236 pounds were applied to the animal or poultry directly or in feed additives and 56,647 pounds were used in and around livestock and poultry buildings or as a manure drench. The quantities used of some insecticides reported in the tables appears to be rather low as related to a livestock and poultry industry the magnitude of that in Ohio. However, as indicated previously, pesticide use for livestock does not approach the scope and magnitude of that used for other agricultural crops. Many of the

pesticide formulations used in pest control management for livestock have very limited concentrations of active ingredient. Observations of Cooperative Extension Specialists indicate that operators with small numbers of animals probably have less tendency to practice adequate pest management using chemical control than do those with larger operations. Hence, pest management in the livestock and poultry industries is probably more typified by the larger operations.

Five insecticides accounted for 65.7 percent of the total used on livestock and poultry in Ohio in 1979. They were: 1) Sevin - 19.3 percent, 2) Korlan - 13.5 percent, 3) Cythion - 13.3 percent, 4) Rabon - 10.9 percent, and 5) Ciodrin - 8.8 percent. Four others in quantities greater than 6000 pounds of active ingredient accounted for another 23.7 percent of the total including Marlate - 6.4 percent, Vapona - 6.3 percent, Co-Ral - 6.0 percent, and Toxaphene + Lindane - 5.0 percent (Table 9).

Beef producers used 46,409 pounds of insecticide active ingredient in 1979 which accounted for 37.8 percent of the total used on livestock and poultry whereas dairy producers used 37,643 pounds and 31.3 percent and swine producers used 10,346 pounds and 8.6 percent of the total (Table 9). With the exception of Sevin used in poultry production, the percent of total insecticides used in the sheep and poultry industries was rather limited. Estimates of total insecticide use on horses and ponies was not calculated because of the insignificant percentage of the animal inventory reported. Based upon the context of many questionnaires returned where only one or two horses or ponies were included in a multiple animal type operation, it was assumed that such horses and ponies were treated with insecticides only in

conjunction with use on the other animals, especially for fly control.

Ohio beef producers used 4696 pounds of Rabon active ingredient for animals in 1979 which constituted 10.1 percent of the total insecticide use in that industry (Table 9). Dairy producers used 7645 pounds of Rabon for animals accounting for 20.3 percent of the insecticide quantity used in that industry. However, dairy producers used 12,499 pounds of Rabon active ingredient for fly control in and around barns and manure piles which was about 96 percent of the total for that use. About 45.3 percent of the total Rabon insecticide was used as a feed additive, either added directly to the feed or as salt lick blocks, to control fly larva and 52.2 percent was used as a larvacide in or around buildings and manure piles. The remainder was used in back rubbers, dusts and sprays for fly control. Approximately 760 pounds of Rabon active ingredient were used by poultry producers in treating for mites and lice.

Approximately 12,133 pounds of Korlan active ingredient and 11,613 pounds of Cythion were used by beef producers for insect control, which accounted for 74.8 and 72.7 percent of the total for that insecticide reported for the entire livestock and poultry industry. Slightly more than 79.5 percent of the Ciodrin used on animals was attributed to the dairy industry with the remainder applied to beef. Likewise, the dairy industry was the largest user of Vapona and Co-Ral for animals accounting for 95.3 and 83.3 percent, respectively. The cattle industry also used 97.7 percent of the Marlata reported almost equally divided between beef (50 percent) and dairy (47.7 percent).

Cythion (Malathion) and Toxaphene + Lindane were the insecticides most often used by swine producers. The 3667 pounds active ingredient of Cythion used constituted 35.4 percent and the 3000 pounds of Toxaphene + Lindane 29 percent of the total insecticide usage on swine. Another 3000 pounds a.i. of Toxaphene + Lindane were used by beef producers, dividing the usage of that insecticide equally between the two industries. Swine producers also used 674 pounds a.i. of Toxaphene alone.

Poultry producers used 23,177 pounds of Sevin active ingredient for control of mites and lice. This constituted 92.5 percent of the insecticides used on poultry. The only other insecticides having significant use were Rabon - 3.3 percent, Ravap - 2.4 percent, and Cythion - 2.0 percent of the total active ingredients used for insect control on poultry.

As indicated in Table 10, livestock and poultry producers in Ohio utilized approximately 56,647 pounds active ingredient insecticide, which included 11,350 Vapona strips, for insect control in animal buildings during 1979. Approximately 66 percent of the amount used was attributed to three insecticides: Rabon - 23 percent, Vapona - 22 percent, and Cythion - 21 percent. Three other insecticides, Ravap - 8.6 percent, Cygon - 7.3 percent, and Marlata - 6.1 percent, accounted for another 22 percent of the use.

From 43 to 49 percent of the livestock and 61 percent of the poultry producers reported good insect control in their operations. Excellent control was reported by 19.5 percent of the poultry and 14.0 percent of the sheep producers whereas from 33 to 43 percent of the livestock producers considered the effectiveness to be fair (Table 11).

With the exception of beef producers at 11.3 percent, less than 10 percent of all livestock and poultry producers considered the effectiveness of their control programs to be poor.

From 41 to 68 percent of the livestock producers are certified pesticide applicators with the sheep producers having the largest percentage at 68.2 followed by swine producers at 57.9, the beef producers at 41.9 and the dairy producers at 40.8 percent (Table 13). By contrast, only 20 percent of the poultry producers and 12.8 percent of the horse and pony owners reported their being certified pesticide applicators. A review of the insecticides used (Table 8 and 10) shows that none have a "restricted use" classification and, thus, it can be assumed that all pesticide applicator certification is probably associated with other farming operations.

The data in Table 14 indicates that from approximately 42 to 63 percent of the livestock and poultry producers in Ohio did not have a building or storage facility exclusively for pesticides. Less than 20 percent provided a barrier to separate the pesticides from other materials when stored in the same building; had locked storage area, which is also reflected in the accessibility of pesticides to unauthorized personnel; kept different pesticides separated and/or segregated; or had facilities equipped for temperature and fire control. Storage facilities were also very lacking in drainage provisions and controlled air movement. A very positive statistic, however, was that almost all producers kept the pesticide in its original container.

As indicated in Table 15, the majority of producers stored surplus pesticides for use in the next season. Most of those who

did dispose of the surplus pesticide used the facilities of a landfill or buried the material in an isolated area. Very few producers disposed of material in a drainage system. Likewise, relative to the disposal of empty pesticide containers, most of the producers used acceptable practices by proper disposal on site or utilization of landfill facilities and/or commercial waste disposal companies (Table 16). In general, only a very low percentage of the producers used disposal techniques that violated safe practices such as using the container for other purposes, letting containers accumulate and not providing proper storage for such, and dumping containers in out-of-the-way places. However, only approximately 30.4 percent of the producers properly rinsed the containers before disposing of them.

Most producers obtained pesticide information from the Cooperative Extension Service, the chemical dealer, or relied upon their own experience, but there was some variation associated with the particular operation (Table 17). Dairy producers relied on the Extension Service and personal experience to an equal 40.8 percent with the dealer a close second at 34.9 percent. Beef and sheep producers preferred the Extension Service as a source of information (49 and 47.1 percent, respectively) with less reliance on the dealer or personal experience. Swine producers utilized those three sources almost equally whereas poultry producers were divided equally between the dealer and their personal experience when selecting pesticides with only a small percentage seeking the advice of the Extension Service. Horse and pony owners preferred their personal experience as the source of information. Table 17 also provides information on the economic and personal

hazard factors involved in making a selection of pesticide purchase. Most producers preferred a pesticide of lower toxicity but also made the selection on the basis of satisfactory and prolonged insect control.

As was to be expected, most of the producers did not use protective clothing when applying insecticides. The majority of the insecticides used were of the toxicity category that would not require extensive protective clothing. Those who did use some protective clothing generally limited it to rubber boots and/or rubber gloves and a head covering which may have been the normal headwear (Table 18). It was somewhat surprising on the number who reported the use of a respirator, particularly in relation to the insecticide involved, and the selection of other protective clothing. This was especially evident in the reports from poultry and horse producers. It is probable, however, that respirators and face shields were related more to the application of pesticides in farm buildings and confined areas. It is difficult to determine from the data reported (Table 18) the actual attitude of livestock and poultry producers to personal safety in pesticide application.



TABLE 1. Response of Livestock and Poultry Producers Survey Questionnaires.

## Number of Surveys

Type of Industry	Mailed	Returned	Returned for incorrect address	Indicating no animal production	From other animal industry with information for this industry <sup>a/</sup>	Total with usable information <sup>b/</sup>	Number of animals indicated on total usable surveys
Beef	1511	340	27	71	100	350	23,605
Dairy	463	135	3	2	41	171	13,036
Swine	320	73	8	7	88	146	56,643
Sheep	602	173	10	62	50	151	12,693
Poultry	154	60	4	12	67	111	2,935,745
Horse & Pony	1408	128	39	26	65	128	715

<sup>a/</sup> Some livestock and poultry producers with a varied industry reported data on all types of livestock production rather than only the specific industry noted on the survey questionnaire.

<sup>b/</sup> Includes all surveys that provided usable information for the specific type of industry.

TABLE 2. Percent of Ohio Livestock and Poultry Included in Pesticide Use Survey.

Industry	Number of Operations			Inventory of Animals		
	CRS <sup>a/</sup> Data	Included in Survey	Percent of Operations in Survey	CRS <sup>a/</sup> Data	Included in Survey	Percent of Inventory in Survey
Beef	40,000 <sup>b/</sup>	350	0.88	790,000 <sup>c/</sup>	23,605	3.0
Dairy	13,000	171	1.32	377,000 <sup>c/</sup>	13,036	3.6
Swine	22,000 <sup>d/</sup>	146	0.66	2,095,000	56,643	2.7
Sheep	10,000	151	1.51	335,000	12,693	3.8
Poultry	12,300	111	0.9	30,620,000	2,935,745	9.6
Horse & Pony	<u>e/</u>	128	<u>e/</u>	250,000 <sup>f/</sup>	715	0.29

<sup>a/</sup> Crop Reporting Service data from Ohio Agricultural Statistics-1979. Ohio Crop Reporting Services, USDA-SEA-ESCS, May 1980.

<sup>b/</sup> Operations in the CRS report for all cattle less those for dairy.

<sup>c/</sup> Calculations on average for the year but not including calves.

<sup>d/</sup> Ohio Cooperative Extension Service estimates of hog producers is about one-half of this number.

<sup>e/</sup> No data available. Horse and pony owners include the many who have only one horse, others who may have several head and also those relatively large stables. Owners include people living in some suburban areas as well as rural.

<sup>f/</sup> Estimates obtained by the Ohio Cooperative Extension Service. Based upon 200,000 in 1975 and the conclusion that the number has continued to increase each year.

TABLE 3. Characteristics of Ohio Livestock and Poultry Farms-1979<sup>a/</sup>

## TYPE OF ANIMAL AND POULTRY INDUSTRY

	All Cattle	Beef	Dairy		Swine	Sheep	Poultry			
			All Chickens	Laying Hens			Broilers	Turkeys		
Number of Operations (thousands)	53	40	13	22	10	12.4	.242			
Average Number of animals during the year (thousands)	1887 <sup>b/</sup>	<u>Over 500 lbs.</u> 790 Bulls = 43 <u>Heifers, steers, bulls, under 500 lbs.</u> 482	<u>Cows</u> 377 <u>Heifers</u> 151	2095 <sup>c/</sup>	335 <sup>b/</sup>	9040 <sup>c/</sup>	19,100	2,480 <sup>d/</sup>		

<sup>a/</sup> Data extracted from Ohio Agricultural Statistics-1979. Ohio Crop Reporting USDA-SEA-ESCS. May 1980.

<sup>b/</sup> Average between inventory of January 1, 1979 and January 1, 1980 and considering production versus marketing during 1979.

<sup>c/</sup> Average from quarterly or monthly data for 1979.

<sup>d/</sup> Total includes those produced for consumption plus breeder hens.

TABLE 4. Operations and Inventory of Ohio Livestock and Poultry Farms by Size Groups - 1979.<sup>a/</sup>

Item	Percent of Operation and Inventory Related to Size Grouping				
<u>All Cattle</u>	<u>1-49</u>	<u>50-99</u>	<u>100-499</u>	<u>500+</u>	
Operations	83.5	10.5	6.0	<u>b/</u>	
Inventory	40.0	24.0	33.1	2.9	
<u>Milk Cow</u>	<u>1-29</u>	<u>30-49</u>	<u>50-99</u>	<u>100+</u>	
Operations	64.5	19.0	14.5	2.0	
Inventory	29.5	26.0	34.5	10.0	
<u>Hogs &amp; Pigs</u>	<u>1-99</u>	<u>100-499</u>	<u>500+</u>		
Operations	78.5 <u>c/</u>	18.0	3.5		
Inventory	21.5	42.5	36.0		
<u>HPLA<sup>d/</sup></u>	<u>3000-9999</u>	<u>10000-19999</u>	<u>20000-49999</u>	<u>50000-99999</u>	<u>100000+</u>
Operations	45.9	20.2	18.2	9.1	6.6
Inventory	7.0	7.0	12.0	16.0	47.0

<sup>a/</sup> Extracted or calculated from data in Ohio Agricultural Statistics - 1979. Ohio Crop Reporting Service, USDA-SEA-ESCS, May 1980.

<sup>b/</sup> Combine with other size groups.

<sup>c/</sup> Ohio Cooperative Extension Service estimates indicate that 78.5 percent of operators with an inventory of less than 100 head is too high, but corresponds more to the profile for swine in Table 5.

<sup>d/</sup> HPLA means Hens and Pullets of Laying Age. Inventory percent totals 89 indicating remaining 11 percent on farms with less than 3000 layers.

TABLE 5. Operations and Inventory of Ohio Livestock and Poultry Farms as Indicated from Survey Returns.

Industry	Number of Operators and Inventory in Size Grouping						
<u>Dairy</u>	<u>1-29</u>	<u>30-49</u>	<u>50-99</u>	<u>100+</u>			
Operations	29	19	73	43			
Inventory	317	720	5204	6795			
<u>Beef</u>	<u>1-25</u>	<u>26-60</u>	<u>61-100</u>	<u>101-200</u>	<u>201-400</u>	<u>&gt;400</u>	
Operations	150	90	36	23	12	11	
Inventory	1768	3976	3374	3357	3569	7405	
<u>Swine</u>	<u>1-25</u>	<u>26-75</u>	<u>76-150</u>	<u>151-300</u>	<u>301-600</u>	<u>601-1000</u>	<u>&gt;1000</u>
Operations	39	17	18	17	27	15	13
Inventory	382	789	2017	4215	12520	11370	25350
<u>Sheep</u>	<u>1-20</u>	<u>21-49</u>	<u>50-99</u>	<u>100-199</u>	<u>200-499</u>	<u>500+</u>	
Operations	40	41	26	22	11	3	
Inventory	449	1354	1645	2852	2793	3600	
<u>Poultry</u>							
a. <u>Chickens</u>	<u>1-99</u>	<u>100-199</u>	<u>1000-9999</u>	<u>10000-49999</u>	<u>50000-100000</u>	<u>&gt;100000</u>	
Operations	44	15	12	21	7	4	
Inventory	1075	3115	63005	466500	460000	1832000	
b. <u>Turkeys</u>			<u>1000-9999</u>	<u>10000-49999</u>			
Operations			2	4			
Inventory			12000	98000			
<u>Horse &amp; Pony</u>	<u>1-2</u>	<u>3-5</u>	<u>6-10</u>	<u>11-19</u>	<u>20-40</u>	<u>41-50</u>	
Operations	54	37	25	8	2	3	
Inventory	79	141	182	116	47	150	

TABLE 6. Operations and Inventory of Ohio Livestock and Poultry Farms as Indicated from Survey Returns.

Industry	Percent of Operators and Inventory in Size Grouping						
<u>Dairy</u>	<u>1-29</u>	<u>30-49</u>	<u>50-99</u>	<u>100+</u>			
Operations	17.7	11.6	44.5	26.2			
Inventory	2.4	5.5	39.9	52.1			
<u>Beef</u>	<u>1-25</u>	<u>26-60</u>	<u>61-100</u>	<u>101-200</u>	<u>201-400</u>	<u>400+</u>	
Operations	46.6	28.0	11.2	7.1	3.7	3.4	
Inventory	7.5	17.0	14.4	14.3	15.2	31.6	
<u>Swine</u>	<u>1-25</u>	<u>26-75</u>	<u>76-150</u>	<u>151-300</u>	<u>301-600</u>	<u>601-1000</u>	<u>&gt;1000</u>
Operations	26.7	11.6	12.3	11.6	18.5	10.3	8.9
Inventory	0.7	1.4	3.6	7.4	22.1	20.0	44.8
<u>Sheep</u>	<u>1-20</u>	<u>21-49</u>	<u>50-99</u>	<u>100-199</u>	<u>200-499</u>	<u>≥500</u>	
Operations	27.8	28.3	18.1	15.3	7.6	2.1	
Inventory	3.5	10.7	13.0	22.5	22.0	28.4	
<u>Poultry</u>							
a. <u>Chickens</u>	<u>1-99</u>	<u>100-999</u>	<u>1000-9999</u>	<u>10000-49999</u>	<u>50000-100000</u>	<u>&gt;100000</u>	
Operations	42.7	14.6	11.7	20.4	6.8	3.9	
Inventory	0.03	0.1	2.2	16.5	16.3	64.8	
b. <u>Turkeys</u>			<u>1000-9999</u>	<u>10000-49999</u>			
Operations			33.3	66.7			
Inventory			10.9	98.1			
<u>Horse &amp; Pony</u>	<u>1-2</u>	<u>3-5</u>	<u>6-10</u>	<u>11-19</u>	<u>20-40</u>	<u>41-50</u>	
Operations	41.9	28.7	19.4	6.2	1.6	2.3	
Inventory	11.0	19.7	25.5	16.2	6.6	21.0	

TABLE 7. Percent of Livestock and Poultry Producers Using Insecticides for Pest Control

Industry	Producers Using Insecticides					
	Pest Control on Animals		Pest Control in Buildings			
	Number of Respondents	Percent Using Insecticides	Single Industry Operation		Multi-industry Operation <sup>a/</sup>	
			Number of Respondents	Percent Using Insecticides	Number of Respondents	Percent Using Insecticides
Dairy	171	67.8	102	68.6	35	74.3
Beef	350	50.9	162	17.9	104	29.8
Swine	146	55.6	34	41.2	30	66.7
Sheep	151	27.8	53	17.0	54	40.7
Poultry	111	33.3	39	53.8	12	75.0
Horse & Pony	128	48.4	18	35.3	13	61.5
All Industry	1057	48.8	441	36.5	248	46.4

<sup>a/</sup>Although these survey questionnaires indicated that the respondent was involved in producing more than one category of the livestock and poultry industry, the report for insecticide use in livestock and poultry buildings is only recorded for that industry for which the survey questionnaire was originally intended.

TABLE 8. Quantities of Pesticide Active Ingredient Used for Pest Control on Animals by Livestock and Poultry Producers Responding to Survey.

Pesticide <sup>a/</sup>	Pounds of Active Ingredient Reported by Responding Producers <sup>b/</sup>						
	Beef (350) <sup>c/</sup>	Dairy (171) <sup>c/</sup>	Sheep (151) <sup>c/</sup>	Swine (146) <sup>c/</sup>	Horse & Pony (128) <sup>c/</sup>	Poultry (111) <sup>c/</sup>	Total
Anthon <sup>d/</sup>					3.6		3.6
Ciovap <sup>d/</sup>	32.4	83.2		9.0			124.6
Co-Ral	29.8	216.7	7.4	0.7	2.0		256.6
Ciodrin	64.9	302.6					367.5
Cygon		4.0				0.3	4.3
Cythion	348.4	7.0	5.9	99.0	0.8	47.9	509.0
Diazinon	0.02						0.02
Dibrom			1.5				1.5
Korlan	364.0	78.6		51.4			494.0
Lindane	13.3			19.6	11.5		44.4
Marlate	114.9	131.7	5.0			2.0	261.6
Neguvon	1.5						1.5
Phenothiazine	1.3						1.3
Pyrethrin	2.0	3.2		0.03	0.8	0.001	6.03
Rabon <sup>e/</sup>	140.9	275.2		.4	8.4	73.0 <sup>f/</sup>	497.9
Ravap <sup>g/</sup>	5.3					57.0	62.3
Ruelene	2.0						2.0
Sevin						2225.0	2225.0
Tiguvon	96.4						96.4
Toxaphene			9.0	18.2	4.0		31.2
Toxaphene & Lindane <sup>h/</sup>	90.0			81.0	2.0		173.2
Vapona	10.5	260.8			1.9		273.2
Warbex	75.0	2.1					77.1

<sup>a/</sup>Pesticide listed by name (trade, common, or product name) as indicated in the 1979 Ohio Cooperative Extension Service Bulletins 473 and L-256 as pesticide recommendations for "Livestock and Farm Buildings" and for "Poultry and Poultry Buildings", respectively. The reference to such names does not involve preference or promotion of that product nor is omission of other trade or products names intended as discriminatory. The relationship between pesticide trade-product names and common names is listed in Appendix 2.

<sup>b/</sup>Pounds of active ingredient calculated from quantities of formulations reported with consideration that in some cases the concentrations of active ingredient in some formulation may be less than one percent.

<sup>c/</sup>Numbers in parenthesis refers to number of respondents.

<sup>d/</sup>Ciovap is a combination product of Ciodrin and Vapona (DDVP) consisting of approximately 83.3 and 16.7 percent of the active ingredient, respectively. Thus of the pounds active ingredient in the table, 27.0, 68.8 and 7.5 pounds for beef, dairy and swine is attributed to Ciodrin and the remainder to Vapona.



TABLE 8. (Continued)

e/ Includes Rabon active ingredient in feed pre-mix at 7.76 percent, free choice mineral at 7.76 percent, dust bag formulations at 3 percent, and salt lick blocks generally containing approximately 0.2467 lbs. per block.

f/ An additional 65.0 pounds of active ingredient was also reported as ingredients in 33 pound blocks, but the relationship to poultry production was not ascertained.

g/ Ravap is a combination product of Rabon and Vapona (DDVP) consisting of approximately 80 percent Rabon and 20 percent Vapona.

h/ Pesticide product consists of 95 percent Toxaphene and 5 percent Lindane.

TABLE 9. Quantities of Pesticide Active Ingredients Used for Pest Control on Livestock and Poultry in Ohio-1979<sup>a/</sup>.

Pesticide <sup>b/</sup>	Pounds of Active Ingredients Used in Production						
	Beef	Dairy	Sheep	Swine	Horse pony <sup>c/</sup> &	Poultry	Total <sup>c/</sup>
Ciovap <sup>d/</sup>	1080	2311		333			3724
Co-Ral	993	6019	195	26			7233
Ciodrin	2163	8406					10569
Cygon		11				3	14
Cythion	11613	19	155	3667		499	15953
Diazinon	1						1
Dibrom			39				39
Korlan	12133	2183		1904			16220
Lindane	433			726			1159
Marlate	3830	3658	158			21	7667
Neguvon	50						50
Phenothiazine	43						43
Pyrethrin	67	89		1		.01	157
Rabon <sup>e/</sup>	4696	7645		15		760	13116
Ravap <sup>f/</sup>	177					594	771
Ruelene	67						67
Sevin						23177	23177
Tiguvon	3213						3213
Toxaphene			237	674			911
Toxaphene & Lindane <sup>g/</sup>	3000			3000			6000
Vapona	350	7244					7594
Warbex	2500	58					2558
<b>TOTAL</b>	<b>46409</b>	<b>37643</b>	<b>784</b>	<b>10346</b>		<b>25054</b>	<b>120236</b>

<sup>a/</sup> Data is calculated on the basis of quantities of pesticides related to the percentage of animal or poultry state inventory reported by survey respondents.

<sup>b/</sup> Pesticides listed by name (trade, common, or product name) as indicated in the 1979 OCES Bulletins 473 and L-256 on pesticide recommendations for "Livestock and Farm Buildings" and for "Poultry and Poultry Buildings", respectively.

<sup>c/</sup> Extrapolated estimates of state totals for horse and pony production is not included because the insignificant percentage of animal inventory reported (Table 8) does not provide a satisfactory basis for calculation.

<sup>d/</sup> Ciovap is a combination product of Ciodrin and Vapona (DDVP) consisting of approximately 83.3 and 16.7 percent of the active ingredient, respectively. Thus of the pounds active ingredient in the table, 950, 1925 and 277 pounds for beef, dairy and swine is attributed to Ciodrin and the remainder to Vapona.

TABLE 9. (Continued)

e/ See note e Table 8. Of the total active ingredient used in the dairy industry (Table 9 and 10), 62.1 percent was used for insect control in and around dairy buildings and for manure drench, 36.1 percent was used as feed additive either added to feed or as salt lick blocks and 1.8 percent was used in backrubbers etc. For beef production 91 percent was used as a feed additive as salt lick blocks and added to the feed.

f/ Ravap is a combination product of Rabon and Vapona (DDVP) consisting of approximately 80 percent Rabon and 20 percent Vapona. Thus of the pounds active ingredient in the table, 141.6 and 475.2 pounds for beef and poultry, respectively is attributed to Rabon and the remainder to Vapona.

g/ Pesticide product consists of 95 percent Toxaphene and 5 percent Lindane thus indicating in the table, 2850 lbs. Toxaphene and 150 lbs. Lindane active ingredient for both the beef and swine industries.

TABLE 10. Quantities of Pesticides Used for Pest Control in Livestock and Poultry Buildings-1979<sup>a/</sup>.

Pesticide	Pounds Active Ingredient Used	
	Reported by Survey Respondents	Extrapolated to Total State-Industry Use <sup>b/</sup>
Chlorfenvinphos	28.0	1048
Ciovap	42.0	1573
Cygon	110.6	4142
Cythion, Malathion	322.8	12090
Diazinon	56.5	2116
Dibrom	9.6	360
Marlate	91.9	3442
Methomyl	0.7	26
Pyrethrin	1.61	60
Rabon <sup>d/</sup>	489.0	12997
Ravap <sup>d/</sup>	130.0	4869
Ronnel	37.8	1416
Vapona, DDVP	334.1	12408 <sup>e/</sup>
TOTAL		56647

<sup>a/</sup> Includes treatment inside and outside of buildings as well as manure drenches, etc.

<sup>b/</sup> Calculated on the basis of quantity as indicated in the responses to the survey related to the total animal/poultry operations from the publication Ohio Agricultural Statistics-1979 Ohio Crop Reporting Service, May 1980, (See Table 2) as adjusted for the percent of survey responses that indicated a multi-type animal operation and in turn for the percent of response that provided information indicating buildings utilized in the operation; i.e.

$$\text{Total pounds a.i.} \times \frac{1067}{97400 \times .639 \times .642} = \frac{\text{pounds a.i. reported}}{.0267}$$

<sup>c/</sup> Ciovap is a combination product containing approximately 83.3 percent Ciodrin and 16.7 percent Vapona (DDVP).

<sup>d/</sup> Ravap is a combination product containing approximately 80 percent Rabon and 20 percent Vapona (DDVP).

<sup>e/</sup> Includes Vapona active ingredient in 303 Farm Strips reported and extrapolated to 11348 for total state use.

TABLE 11. Effectiveness of Insect Control Program

Industry	Number of Respondents	(Percent) Evaluation of Control			
		Excellent	Good	Fair	Poor
Dairy	64	4.5	47.0	40.9	7.6
Beef	194	4.6	42.8	41.2	11.3
Swine	61	4.9	49.2	42.6	3.3
Sheep	86	14.0	44.2	32.6	9.3
Poultry	41	19.5	61.0	17.1	2.4
Horse & Pony	49	10.2	49.0	36.7	4.1

TABLE 12. Most Serious Livestock and Poultry Pests in Ohio According to Producers Response

Insect Pest	Percent of Survey Respondents who Listed Pest as Most Serious					
	Dairy (113)	Beef (196)	Swine (59)	Sheep (78)	Poultry (36)	Horse & Pony (50)
Flies	39.8	25.5	27.1	47.4	45.9	42.0
Grub	3.5	9.2	1.7	5.1		2.0
Face fly	35.4	45.4	8.5	14.1	8.1	22.0
Horn fly	15.0	9.7	8.5	2.6	5.4	2.0
House fly	12.4	2.6	5.1	6.4	18.5	6.0
Stable fly	17.7	3.6	6.8		5.4	14.0
Horse fly	3.5	3.6				10.0
Deer fly	2.6	4.1		3.9		8.0
Mosquitoes	0.9	1.5		1.3		10.0
Lice	2.6	36.2	45.8	15.4	27.0	4.0
Mites		1.0	1.7		40.1	
Gnats		0.5				
Bots		1.5				12.0
Mange	0.9	3.1	33.9		2.7	4.0
Ticks		1.0	1.7	11.5		
Wool Maggot				2.6		
Black fly						4.0

TABLE 13. Livestock and Poultry Producers Who Are Certified Pesticide Applicators.

Industry	Number of Respondents	Percent of Certified Applicators
Dairy	76	40.8
Beef	186	41.9
Swine	57	57.9
Sheep	88	68.2
Poultry	40	20.0
Horse & Pony	47	12.8

TABLE 14. Procedures Used by Livestock and Poultry Producers in Pesticide Storage

Storage Procedure	Practiced by Producers (percent) <sup>a/</sup>					
	Dairy (96) <sup>b/</sup>	Beef (152) <sup>b/</sup>	Swine (52) <sup>b/</sup>	Sheep (49) <sup>b/</sup>	Poultry (36) <sup>b/</sup>	Horse & Pony (35) <sup>b/</sup>
1. Stored in a separate building	15.8	28.9	17.3	22.5	30.6	20.0
2. Stored in a building housing other materials	55.8	48.7	48.1	51.0	41.7	62.8
3. Separated by a barrier from other materials in the building	13.7	9.2	19.2	8.2	19.4	17.1
4. Kept under locked storage	3.1	10.5	19.2	14.3	11.1	14.3
5. Storage area is fireproof	2.1	2.6	3.8	6.1	0.0	5.7
6. Storage area has facilities for fire protection	5.3	6.6	5.8	12.2	16.7	17.1
7. Storage area has facilities for temperature control	7.4	9.9	13.5	4.1	19.4	17.1
8. Storage area has facilities for air movement	22.1	19.7	30.8	20.4	19.4	37.1
9. Storage area has provisions for separation and segregation of different pesticide materials	11.6	9.9	15.4	18.4	11.1	17.1
10. Storage area is equipped with isolated drainage system	3.1	4.6	0.0	2.0	2.8	8.6
11. Storage area is accessible only to authorized personnel	7.4	20.4	11.5	16.3	22.2	22.8
12. Pesticides are sometimes stored in other than the original container	1.0	0.7	0.0	2.0	0.0	8.6

<sup>a/</sup> The percentage total exceeds 100% because producers were instructed to indicate all procedures that were applicable to their operation.

<sup>b/</sup> Number of respondents to survey question.



TABLE 15. Procedures Used by Livestock and Poultry Producers in Disposing of Surplus Pesticides

Procedure	Practiced by Producers (percent) <sup>a/</sup>					
	Dairy (94) <sup>b/</sup>	Beef (96) <sup>b/</sup>	Swine (50) <sup>b/</sup>	Sheep (47) <sup>b/</sup>	Poultry (33) <sup>b/</sup>	Horse & Pony (38) <sup>b/</sup>
1. Surplus pesticide stored for use in next season	85.1	51.0	80.0	87.2	66.7	81.6
2. Surplus pesticide returned to dealer	4.2	12.5	8.0	2.1	6.1	0.0
3. Surplus pesticide applied for some other labelled use	4.2	8.3	6.0	0.0	9.1	2.6
4. Surplus pesticide diluted and sprayed over isolated area	0.0	2.1	2.0	0.0	3.0	2.6
5. Surplus pesticide buried in an isolated area	2.1	17.7	16.0	8.5	3.0	0.0
6. Surplus pesticide burned or incinerated	5.3	7.3	4.0	6.4	12.1	7.9
7. Surplus pesticide disposed of in a landfill operation	10.6	16.7	12.0	14.9	12.1	10.5
8. Surplus pesticide disposed of by a commercial waste disposal company	7.1	8.3	4.0	6.4	0.0	15.8
9. Surplus pesticide disposed of in environmental, municipal, or public drainage systems	1.1	0.0	0.0	0.0	0.0	0.0

<sup>a/</sup>The percentage total exceeds 100% because the producers were instructed to indicate all procedures that were applicable to the operation.

<sup>b/</sup>Number of respondents to survey question.

TABLE 16. Procedures Used by Livestock and Poultry Producers in Disposing of Empty Pesticide Containers

Procedure	Practiced by Producers (percent) <sup>a/</sup>					
	Dairy (105) <sup>b/</sup>	Beef (163) <sup>b/</sup>	Swine (55) <sup>b/</sup>	Sheep (56) <sup>b/</sup>	Poultry (31) <sup>b/</sup>	Horse & Pony (37) <sup>b/</sup>
1. Metal and plastic containers are decontaminated by the triple rinse or similar procedure	28.6	30.1	40.0	28.6	38.7	18.9
2. Combustible containers are burned on premises	35.2	42.9	47.3	39.3	58.1	24.3
3. Containers are buried on premises	13.3	27.6	21.8	14.3	12.9	8.1
4. Containers disposed of in sanitary landfill facilities	48.6	40.5	49.1	50.0	41.9	21.9
5. Large containers are returned to the dealer or manufacturer	4.8	3.7	5.4	3.6	3.2	2.7
6. Containers are disposed of through barrel reclaimers, etc.	0.9	0.6	0.0	1.8	3.2	0.0
7. Containers are disposed of through commercial waste disposal companies	15.2	6.7	5.4	17.9	12.9	48.6
8. Containers are sometimes used for other purposes on the premises or by others	1.9	0.6	3.6	0.0	3.2	2.7
9. Containers accumulate on premises	0.0	1.2	3.6	1.8	0.0	2.7
10. Containers are dumped at out-of-the-way places	3.8	5.5	0.0	0.0	3.2	0.0
11. Containers are stored for future disposal	2.8	3.1	3.6	1.8	6.5	2.7
12. Storage facilities for empty containers are similar to or the same as that for pesticide storage and are kept locked	1.9	3.7	1.8	1.8	0.0	2.7

<sup>a/</sup>The percentage total exceeds 100% because the producers were instructed to indicate all procedures that were applicable to the operation.

<sup>b/</sup>Number of respondents to survey question.

TABLE 17. Factors Considered the Most Important by Livestock and Poultry Producers in Selection of Pesticides.

Factors	Producer Response (percent) <sup>a/</sup>					
	Dairy (103) <sup>b/</sup>	Beef (174) <sup>b/</sup>	Swine (53) <sup>b/</sup>	Sheep (68) <sup>b/</sup>	Poultry (41) <sup>b/</sup>	Horse & Pony (46) <sup>b/</sup>
1. <u>Information Source:</u>						
A. Recommendation of dealer	34.9	31.0	35.8	22.1	41.5	21.7
B. Recommendation of neighbor	2.9	3.0	3.8	4.4	7.3	4.3
C. Recommendation of extension agent	40.8	49.0	35.8	47.1	12.2	21.7
D. Advertisements from companies, radio, TV	1.9	2.0	0.0	0.0	4.9	0.0
E. Personal experience	40.8	24.0	37.7	36.8	41.5	56.5
2. <u>Economic Factors:</u>						
A. Cost per unit treated	(73) <sup>b/</sup> 43.8	(135) <sup>b/</sup> 50.4	(41) <sup>b/</sup> 43.9	(52) <sup>b/</sup> 38.5	(30) <sup>b/</sup> 43.3	(41) <sup>b/</sup> 56.1
B. Compatibility with existing equipment	56.2	49.6	56.1	61.5	56.7	43.9
3. <u>Personal Hazard Factors:</u> (Given the choice between two chemicals with equal control potential, indicate the criteria you would use to make your choice).						
A. Choice of chemical with lower toxicity	(69) <sup>b/</sup> 40.6	(129) <sup>b/</sup> 24.8	(39) <sup>b/</sup> 28.2	(54) <sup>b/</sup> 38.9	(25) <sup>b/</sup> 40.0	(41) <sup>b/</sup> 46.3
B. Choice of chemical requiring less personal protection	15.9	20.2	15.4	11.1	4.0	14.7
C. Choice of chemical not requiring applicator certification	17.4	13.2	12.8	16.7	8.0	9.7
D. Deciding factor is satisfactory pest control--toxicity of chemical is of secondary consideration	18.8	21.7	30.8	7.4	44.0	9.7
E. Choice of chemical with short treatment to slaughter day waiting time	2.9	5.4	7.7	9.3	4.0	0.0
F. Choice of chemical with prolonged control	30.4	19.4	23.1	16.7	20.0	24.4

<sup>a/</sup> The percentage total for each section may exceed 100% because individual producers may have responded to more than one factor in that section of equal applicability.

<sup>b/</sup> Number of respondents to survey question.

TABLE 18. Protective Clothing and Equipment Used by Livestock and Poultry Producers when Handling Pesticides.

Pesticide		Number of Respondents Indicating Use of Protective Clothing/Equipment with Pesticides							
Name	Number Reporting Use	None	Rubber Boots	Rubber Gloves	Spray Suit	Rubber Apron	Head Covering	Face Shield	Respirator
A. <u>Beef Producers (101)<sup>a/</sup></u>									
Ciodrin	9	5	1	3			1		1
Ciovap	5	2		2			1		
Copper	1	1							
Co-Ral	16	8		5			2	1	1
Cygon	4	2	1	1	1		1		
Cythion	12	9	1	3			2		
Diazinon	5	1		2				2	
Dibrom	1								1
Korlan	10	5	1	2		1	1	1	
Lindane	10	7		4				1	
Marlate	15	12		3					1
Neguvon	2	1		1				1	
Pyrethrin	5	5							
Rabon	10	10							
Ravap	1			1					
Ruelene	1		1	1					
Sevin	21	14		4	1		2	2	
Spotton	9	4	1	4		1	1		
Toxaphene	5	1	1	2			1	1	
Toxaphene + Lindane	8	4		3				1	
Vapona	13	12		1					
Warbex	29	13	4	12		1	3	2	
B. <u>Dairy Producers (51)<sup>a/</sup></u>									
Ciodrin	14	12	1				1	2	
Ciovap	7	6	1	1					
Co-Ral	10	9	1	1			1		1
Cygon	13	4	3	5	1	1	4	1	1
Cypona	1	1							
Cythion	3		1	1			2		
Diazinon	3	1		2		1	1		
Korlan	2	2							
Lindane	3	2	1	1					
Marlate	16	10		3		1	1	2	1
Pyrethrin	23	20	1				1	1	2
Rabon	12	11		1		1	1		
Rabon + Pyrethrin	4	3						1	

TABLE 18. (cont'd) Protective Clothing and Equipment Used by Livestock and Poultry Producers when Handling Pesticides.

Pesticide		Number of Respondents Indicating Use of Protective Clothing/Equipment with Pesticides							
Name	Number Reporting Use	None	Rubber Boots	Rubber Gloves	Spray Suit	Rubber Apron	Head Covering	Face Shield	Respirator
<b>B. Dairy Producers (51)<sup>a/</sup></b>									
Ruelene	1							1	
Sevin	9	7	1	1			1		
Toxaphene + Lindane	4		1	2	1	1	2	1	1
Tox-o-wik	3	1		2					
Vapona	14	11	2	2			1		1
Warbex	2	2							
<b>C. Sheep Producers (25)<sup>a/</sup></b>									
Black Leaf 40	1	1							
Ciodrin	1		1	1	1			1	
Co-Ral	3		1	3					
Diazinon	3		2	2	1				3
Dibrom	1	1							
Korlan	2	1	1				1		
Lindane	2	1	1	1					
Marlate	2	1		1					
Pyrethrin	6	5	1						
Rabon	1	1							
Sevin	7	4		2					2
Toxaphene	4	1	2	1		1			
Toxaphene + Lindane	2	1				1			
Trichlorfon	1			1					1
Vapona	9	7	1	2	1		1	1	
<b>D. Swine Producers (34)<sup>a/</sup></b>									
Giovap	1	1							
Copper Residual	1		1	1			1		
Co-Ral	2	2							
Cygon	1			1		1			
Cythion	3	1	1	2	1		1	1	1
Korlan	4	3	1	1			1		
Lindane	13	3	7	5	2	2	6	2	2
Marlate	1						1		1
Pyrethrin	7	5	1		1		1		
Rabon	1				1				
Rabon + Pyrethrin	1				1				
Ravap	1								1
Sevin	5	3	1				2		1

TABLE 18. (cont'd) Protective Clothing and Equipment Used by Livestock and Poultry Producers when Handling Pesticides.

Pesticide		Number of Respondents Indicating Use of Protective Clothing/Equipment with Pesticides							
Name	Number Reporting Use	None	Rubber Boots	Rubber Gloves	Spray Suit	Rubber Apron	Head Covering	Face Shield	Respirator
D. <u>Swine Producers</u> (34) <sup>a/</sup>									
Tiguvon	11	7	2	4				2	
Trichlorfon	5	2	2	3			2		
Toxaphene	4	3	1						
Toxaphene + Lindane	5	1	2	1			1	1	
Vapona	8	5	2	1			2		1
E. <u>Poultry Producers</u> (25) <sup>a/</sup>									
Copper Residual	2	1							1
Co-Ral	2	1							1
Cygon	8	2	1	2			2	3	2
Diazinon	2	1							1
Korlan	2		1	1			1		2
Lindane	1	1							
Malathion	2	1	1	1			1		
Marlate	2			1					1
Methomyl	1			1	1				
Pyrethrin	8	5	1	1			2	2	2
Rabon	5		1	1			2	1	3
Rabon + Pyrethrin	1								1
Ravap	3		1	1			1	1	2
Sevin	16	3	6	7	1		3	5	7
Tiguvon	2	1		1			1		
Vapona	5	2	1	1				2	2
F. <u>Horse &amp; Pony</u> (19) <sup>a/</sup>									
Diazinon	1	1							
Dibrom	1			1	1		1	1	1
Korlan	1		1	1			1		
Lindane	6	4	1	1					1
Pyrethrin	9	5	2		1		1	1	2
Rabon	2	1		1	1		1	1	1
Sevin	6	4	1	1	1		1	1	2
Tiguvon	1		1	1					
Toxaphene	2		1	1	1		1	1	1
Trichlorfon	4	4							
Vapona	6	4	1	1					1

<sup>a/</sup>Number of producers who responded to the question.

1. The first section concerns pesticide use on animals and is organized to facilitate as little writing and time involvement as possible. However, it does require that the information be as accurate as possible. Check all chemical entries in the survey with either "Yes" or "No" relative to use in 1979. For all materials and formulations used, designated by checking "Yes", write the amount in pounds, gallons, etc., of the particular pesticide formulation purchased and used in 1979. If you are specifying the amount of active ingredient, please indicate; otherwise it will be assumed that the entry indicates only the quantity of the formulated product purchased from the dealer. If the same formulated product is used for the control of several insects, in order to avoid duplication the total amount purchased should be recorded only once with the information of the first entry and reference given to that entry either in the Amount Purchased or Remarks column. If, however, the quantity of pesticide was purchased for a specific pest control problem and used only for that pest, the information should be recorded. The Remarks column can also be used to indicate effectiveness of the treatment and number of treatments used or other pertinent information you wish to convey. An example using coumaphos 11.6% EC Spray of the procedure in submitting information is as follows:

<u>Pest</u>	<u>Material (Sprays)</u>	<u>Material Used</u>	<u>Amt. Purchased, etc. 1979</u>	<u>Remarks, etc.</u>
CATTLE GRUB	coumaphos 11.6% EC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10 gallons	Other insects not included on the list.
FACE FLY	coumaphos 11.6% EC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(See CATTLE GRUB)	
LICE	coumaphos 11.6% EC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5 gallons	Separate purchase from that for cattle grub and face fly.

2. Information in the second section pertains to pest control in livestock (and/or poultry buildings). Please check whether or not the pesticide formulation was used and the total amount of that material purchased and used in 1979. If the pesticide formulation was used for other pest control measures, avoid duplication by following procedures indicated for the previous section. Example for dichlorvos 23.4% EC:

<u>Pest</u>	<u>Formulation</u>	<u>Material Used</u>	<u>Amount Purchased</u>
FACE FLY	dichlorvos 23.4% EC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10 gallons
MOSQUITOES	dichlorvos 23.4% EC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See FACE FLY

#### LIVESTOCK BUILDINGS

Residual Spray	dichlorvos 23.4% EC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See FACE FLY
Manure Drench	dichlorvos 23.4% EC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	15 gallons - Separate purchased from face fly entry.

3. The third section concerns pesticide applicator protection. Place a check to the left of each pesticide chemical used in 1979 and then check in the appropriate columns to the left for the protective gear that was used during mixing, loading, and/or application of the pesticide.
4. The last section involves a series of questions that are self explanatory. It is important that these questions be answered as completely as possible. All information will be treated as confidential.



Cooperative Extension Service  
The Ohio State University

Entomology  
1735 Neil Avenue  
Columbus, Ohio 43210

January 9, 1980

Dear Livestock/Poultry Producer:

In order to satisfactorily answer questions raised by the Environmental Protection Agency during their review of pesticides in the registration/reregistration process, it is essential that we have accurate information on the use and, consequently, the essential nature of the pesticide to the agricultural industry in Ohio. Particularly is this important as we assist USDA in organizing the Benefits/Use package in defending pesticide uses in EPA's RPAR (Rebuttable Presumption Against Registration) process.

Our most accurate and hence reliable use information comes from you--the producer of agricultural commodities. Thus we are asking your cooperation by taking a few minutes to complete the information in the enclosed survey questionnaire and returning it to us within the next two or three weeks. All individual information will be kept confidential. We are interested mainly in compiling totals and information representative of the industry. Help us to help you retain the pesticides that are necessary to your agricultural operation.

Thank you.


Yours truly,

*Ted L Jones*  
Ted L. Jones  
Assistant Director  
Agricultural Industry

*Acie C Waldron*  
Acie C. Waldron  
Coordinator NCRPIAP and  
Ohio PIAP Liaison Coordinator




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BEEF CATTLE

Pests	Material and Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control another insect, indicate here.	
	<b>CATTLE GRUB</b>				
	<b>SPRAYS</b>				
		coumaphos (Co-Ral) 11.6% EC	___ Yes ___ No	_____	_____
		25.0% WP	___ Yes ___ No	_____	_____
		crufomate (Ruelene) 25.0%	___ Yes ___ No	_____	_____
		phosmet (Prolate) 11.6% E	___ Yes ___ No	_____	_____
	<b>POUR-ONS</b>				
		coumaphos (Co-Ral) 4.0%	___ Yes ___ No	_____	_____
		crufomate (Ruelene) 25.0%	___ Yes ___ No	_____	_____
		famphur (Warbex) 13.2%	___ Yes ___ No	_____	_____
	fenthion (Spotton) 20.0%	___ Yes ___ No	_____	_____	



## BEEF CATTLE (continued)

Pests	Material and Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control another insect, indicate here.
CATTLE GRUB	<u>POUR-ONS</u>			
	fenthion (Tiguvon) 3.0%	___ Yes ___ No	_____	_____
	phosmet (Prolate) 11.6% E	___ Yes ___ No	_____	_____
	trichlorfon (Neguvon) 8.0%	___ Yes ___ No	_____	_____
	<u>FEED ADDITIVES</u>			
	ronnel (Korlan) 5.5% (in loose minerals)	___ Yes ___ No	_____	_____
	5.5% (in block or loose mineral mix)	___ Yes ___ No	_____	_____
FACE FLY HORN FLY HOUSE FLY STABLE FLY	<u>SPRAYS</u>			
	crotoxyphos (Ciodrin) 14.4% EC	___ Yes ___ No	_____	_____
	crotoxyphos and dichlorvos (Ciovap) 12.5% EC	___ Yes ___ No	_____	_____
	crotoxyphos and dichlorvos (Ciovap) 1.25% EC oil base	___ Yes ___ No	_____	_____
	dichlorvos (Vapona) 23.4% EC	___ Yes ___ No	_____	_____
	pyrethrins-- synergized 0.03% to 0.1%	___ Yes ___ No	_____	_____
	plus synergist 0.5% to 1.0%	___ Yes ___ No	_____	_____
	<u>FEED ADDITIVES</u>			
	tetrachlorvinphos (Rabon) 97.3% oral larvicide	___ Yes ___ No	_____	_____
FACE FLY 	<u>SPRAYS</u>			
	crotoxyphos and dichlorvos (Ciovap) 12.5%	___ Yes ___ No	_____	_____
HOUSE FLY STABLE FLY 	<u>SPRAYS</u>			
	crotoxyphos (Ciodrin) 14.4% EC 	___ Yes ___ No	_____	_____
HOUSE FLY	STABLE FLY			

## BEEF CATTLE (continued)

Pests	Material and Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control another insect, indicate here.
FACE FLY	<u>BACKRUBBERS OR FACERUBBERS</u>			
HORN FLY	coumaphos (Co-Ral) 11.6% EC	___ Yes ___ No	_____	_____
	crotoxyphos and dichlorvos (Ciovap) 12.5% EC	___ Yes ___ No	_____	_____
	1.25% EC	___ Yes ___ No	_____	_____
	crotoxyphos (Ciodrin) 14.4% EC	___ Yes ___ No	_____	_____
	ronnel (Korlan) 24.0% E	___ Yes ___ No	_____	_____
	tetrachlorvinphos and dichlorvos (Ravap) 28.7 EC	___ Yes ___ No	_____	_____
	1.25% EC oil base	___ Yes ___ No	_____	_____
	<u>DUSTS</u>			
	crotoxyphos (Ciodrin) 3.0%	___ Yes ___ No	_____	_____
	malathion (Cythion) 4.0%	___ Yes ___ No	_____	_____
	tetrachlorvinphos (Rabon) 3.0%	___ Yes ___ No	_____	_____
HORN FLY	<u>POUR-ONS</u>			
	crufomate (Ruelene) 25.0% E	___ Yes ___ No	_____	_____
	ronnel (Korlan) 24.5% EC	___ Yes ___ No	_____	_____
	<u>FEED ADDITIVES</u>			
	ronnel (Korlan) 5.5% (in block or loose mineral mix)	___ Yes ___ No	_____	_____
	<u>BACKRUBBERS OR FACERUBBERS</u>			
	malathion (Cythion) 57.0% EC	___ Yes ___ No	_____	_____
	methoxychlor (Marlate) 25.0% EC	___ Yes ___ No	_____	_____
	tetrachlorvinphos (Rabon) 24.0% EC	___ Yes ___ No	_____	_____

Remarks: If this material was used to control another insect, indicate here.

Pests	Material and Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control another insect, indicate here.	
HORN FLY	<u>DUSTS</u>				
	coumaphos (Co-Ral)	1.0X	___ Yes ___ No	_____	_____
	malathion (Cythion)	4.0X	___ Yes ___ No	_____	_____
		5.0X	___ Yes ___ No	_____	_____
	methoxychlor (Marlate)	50.0X WP	___ Yes ___ No	_____	_____
	<u>SPRAYS</u>				
	coumaphos (Co-Ral)	11.6X EC	___ Yes ___ No	_____	_____
		25.0X WP	___ Yes ___ No	_____	_____
	crufomate (Ruelene)	25.0X	___ Yes ___ No	_____	_____
	malathion (Cythion)	57.0X EC	___ Yes ___ No	_____	_____
	phosmet (Prolate)	11.6X E	___ Yes ___ No	_____	_____
	ronnel (Korlan)	24.0X E	___ Yes ___ No	_____	_____
	tetrachlorvinphos (Rabon)	50.0X WP	___ Yes ___ No	_____	_____
		24.0X EC	___ Yes ___ No	_____	_____
	tetrachlorvinphos and dichlorvos (Ravap)	28.7X EC	___ Yes ___ No	_____	_____
HORN FLY STABLE FLY	<u>SPRAYS</u>				
	lindane	25.0X WP	___ Yes ___ No	_____	_____
	toxaphene and lindane	45.1X WP	___ Yes ___ No	_____	_____
MOSQUITOES	<u>SPRAYS</u>				
	dichlorvos (Vapona)	23.4X EC	___ Yes ___ No	_____	_____
	1.0X EC oil base	___ Yes ___ No	_____	_____	





Pests	Material and Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control another insect, indicate here.
MOSQUITOES	<u>SPRAYS</u> pyrethrins-- synergized 0.03% to 0.1%	___ Yes ___ No	_____	_____
	plus synergist 0.5% to 1.0%	___ Yes ___ No	_____	_____
LICE	<u>SPRAYS</u> coumaphos (Co-Ral) 11.6% EC	___ Yes ___ No	_____	_____
	25.0% WP	___ Yes ___ No	_____	_____
	crotoxyphos and dichlorvos (Ciovap) 12.5% EC	___ Yes ___ No	_____	_____
	1.25% EC oil base	___ Yes ___ No	_____	_____
	crotoxyphos (Ciodrin) 14.4% EC	___ Yes ___ No	_____	_____
	crufomate (Ruelene) 25.0% EC	___ Yes ___ No	_____	_____
	lindane 25.0% WP	___ Yes ___ No	_____	_____
	malathion (Cythion) 57.0% EC	___ Yes ___ No	_____	_____
	25.0% WP	___ Yes ___ No	_____	_____
	methoxychlor (Marlate) 50.0% WP	___ Yes ___ No	_____	_____
	2.0% EC	___ Yes ___ No	_____	_____
	phosmet (Prolate) 11.6% E	___ Yes ___ No	_____	_____
	ronnel (Korlan) 24.0% E	___ Yes ___ No	_____	_____
	tetrachlorvinphos (Rabon) 50.0% WP	___ Yes ___ No	_____	_____
	24.0% EC	___ Yes ___ No	_____	_____
	tetrachlorvinphos and dichlorvos (Ravap) 28.7% EC	___ Yes ___ No	_____	_____
	toxaphene and lindane 45.1% EC	___ Yes ___ No	_____	_____




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Pests	Material and Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control another insect, indicate here.
LICE	BACKRUBBERS OR FACERUBBERS			
	malathion (Cythion) 57.0% EC	___ Yes ___ No	_____	_____
	methoxychlor (Marlate) 25.0% EC	___ Yes ___ No	_____	_____
	ronnel (Korlan) 24.0% E	___ Yes ___ No	_____	_____
	POUR-ONS crufomate (Ruelene) 25.0%	___ Yes ___ No	_____	_____
	famphur (Warbex) 13.2%	___ Yes ___ No	_____	_____
	fenthion (Lysoff) 7.6%	___ Yes ___ No	_____	_____
	fenthion (Tiguvon) 3.0%	___ Yes ___ No	_____	_____
	phosmet (prolate) 11.6% E	___ Yes ___ No	_____	_____
	ronnel (Korlan) 24.5% EC	___ Yes ___ No	_____	_____
	trichlorfon (Neguvon) 8.0%	___ Yes ___ No	_____	_____
	<u>DUSTS</u>			
	coumaphos (Co-Ral) 1.0%	___ Yes ___ No	_____	_____
	crotoxyphos (Ciodrin) 3.0%	___ Yes ___ No	_____	_____
	malathion (Cythion) 4.0%	___ Yes ___ No	_____	_____
	5.0%	___ Yes ___ No	_____	_____
	methoxychlor (Marlate) 50.0% WP	___ Yes ___ No	_____	_____
CHORIOPTIC MITES	<u>SPRAYS</u> crotoxyphos and dichlorvos (ciovap) 12.5% EC	___ Yes ___ No	_____	_____



## DAIRY CATTLE

Pests	Material and Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control another insect, indicate here.	
<b>CATTLE GRUB</b> (Non-lactating animals)  Note: No pesticides are currently registered for control of cattle grubs on lactating dairy cattle.	<u>SPRAYS</u>				
	coumaphos (Co-Ral) 11.6% EC	___ Yes ___ No	_____	_____	
	25.0% WP	___ Yes ___ No	_____	_____	
	crufomate (Ruelene) 25.0% E	___ Yes ___ No	_____	_____	
	<u>POUR-ONS</u>				
	coumaphos (Co-Ral) 4.0%	___ Yes ___ No	_____	_____	
	famphur (Warbox) 13.2%	___ Yes ___ No	_____	_____	
	fenthion (Spotton) 20.0%	___ Yes ___ No	_____	_____	
	fenthion (Tiguvon) 3.0%	___ Yes ___ No	_____	_____	
	trichlorfon (Neguvon) 8.0%	___ Yes ___ No	_____	_____	
	<u>FEED ADDITIVES</u>				
	ronnel (Korlan) 5.5% (in loose minerals)	___ Yes ___ No	_____	_____	
	ronnel (Korlan) 5.5% (in block or loose mineral mix)	___ Yes ___ No	_____	_____	
	<b>FACE FLY</b> 	<u>SPRAYS</u>			
		crotoxyphos (Ciodrin) 14.4% EC	___ Yes ___ No	_____	_____
crotoxyphos and dichlorvos (Ciovap) 12.5% EC		___ Yes ___ No	_____	_____	
dichlorvos (Vapona) 23.4% EC		___ Yes ___ No	_____	_____	
1.0% EC		___ Yes ___ No	_____	_____	
pyrethrins—synergized 0.03% to 0.1%		___ Yes ___ No	_____	_____	
plus synergist 0.5% to 1.0%		___ Yes ___ No	_____	_____	
<u>FEED ADDITIVES</u>					
tetrachlorvinphos (Rabon) 97.3% oral larvicide		___ Yes ___ No	_____	_____	
<b>FACE FLY</b> <b>HORN FLY</b>		<u>JACKRUBBERS OF FACERUBBERS</u>			
	coumaphos (Co-Ral) 11.6% EC	___ Yes ___ No	_____	_____	
	crotoxyphos and dichlorvos (Ciovap) 12.5% EC	___ Yes ___ No	_____	_____	
	1.25% EC	___ Yes ___ No	_____	_____	
	crotoxyphos (Ciodrin) 14.4% EC	___ Yes ___ No	_____	_____	
	ronnel (Corlan) 24.1% E	___ Yes ___ No	_____	_____	




DAIRY CATTLE (continued)

Pests	Material And Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control another insect, indicate here.
<b>FACE FLY</b>	<u>DUSTS</u>			
<b>HORN FLY</b>	crotoxyphos (Ciodrin) 3.0X	___ Yes ___ No	_____	_____
	tetrachlorvinphos (Rabon) 3.0X	___ Yes ___ No	_____	_____
	<u>SPRAYS</u>			
	crotoxyphos (Ciodrin) 14.4X EC	___ Yes ___ No	_____	_____
<b>HORN FLY</b>	<u>DUSTS</u>			
	coumaphos (Co-Ral) 1.0X	___ Yes ___ No	_____	_____
	malathion (Cythion) 4.0X	___ Yes ___ No	_____	_____
	5.0X	___ Yes ___ No	_____	_____
	<u>SPRAYS</u>			
	methoxychlor (Marlate) 50.0X WP	___ Yes ___ No	_____	_____
<b>HOUSE FLY</b> <b>STABLE FLY</b>	<u>SPRAYS</u>			
	crotoxyphos (Ciodrin) 14.4X EC	___ Yes ___ No	_____	_____
<b>HOUSE FLY</b>				
	<b>STABLE FLY</b>			
<b>MOSQUITOES</b>	<u>SPRAYS</u>			
	dichlorvos (Vapona) 23.4X EC	___ Yes ___ No	_____	_____
	1.0X EC oil base	___ Yes ___ No	_____	_____
	pyrethrins-- synergized 0.03X to 0.1X	___ Yes ___ No	_____	_____
	plus synergist 0.5X to 1.0X	___ Yes ___ No	_____	_____



## DAIRY CATTLE (continued)

Pests	Material and Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control another insect, indicate here.
<b>LICE</b> 	<u>SPRAYS</u>			
	coumaphos (Co-Ral) 11.6% EC	___ Yes ___ No	_____	_____
	25.0% WP	___ Yes ___ No	_____	_____
	crotoxyphos and dichlorvos (Ciovap) 12.5% EC	___ Yes ___ No	_____	_____
	1.25% EC oil base	___ Yes ___ No	_____	_____
	crotoxyphos (Ciodrin) 14.4% EC	___ Yes ___ No	_____	_____
	<u>DUSTS</u>			
	coumaphos (Co-Ral) 1.0%	___ Yes ___ No	_____	_____
	crotoxyphos (Ciodrin) 3.0%	___ Yes ___ No	_____	_____
	<u>BACKRUBBER</u>			
ronnel (Korlan) 24.0% EC	___ Yes ___ No	_____	_____	
<b>CHORIOPTIC MITES</b> 	<u>SPRAYS</u>			
	crotoxyphos and dichlorvos (Ciovap) 12.5% EC	___ Yes ___ No	_____	_____





Pests	Material and Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control another insect, indicate here.
KEDS "TICKS" LICE   	<u>SPRAYS</u> coumaphos (Co-Ral) 25.0Z WP	___ Yes ___ No	_____	_____
	diazinon 50.0Z WP	___ Yes ___ No	_____	_____
	dioxathion (Delnav) 30.0Z EC	___ Yes ___ No	_____	_____
	malathion (Cythion) 25.0Z WP	___ Yes ___ No	_____	_____
	57.0Z EC	___ Yes ___ No	_____	_____
	methoxychlor (Marlate) 50.0Z WP	___ Yes ___ No	_____	_____
	ronnel (Korlan) 24.0Z EC	___ Yes ___ No	_____	_____
	<u>SPRINKLE</u> diazinon 50.0Z WP	___ Yes ___ No	_____	_____
	ronnel (Korlan) 24.0Z EC	___ Yes ___ No	_____	_____
	<u>SPOT-ON</u> ronnel (Korlan) 24.5Z	___ Yes ___ No	_____	_____
<u>DUSTS</u> diazinon 2.0Z	___ Yes ___ No	_____	_____	
methoxychlor (Marlate) 50.0Z WP	___ Yes ___ No	_____	_____	
toxaphene 5.0Z	___ Yes ___ No	_____	_____	
61.0Z EC	___ Yes ___ No	_____	_____	
WOOL MAGGOTS (Fleace Worms) 	<u>SPRAYS</u> coumaphos (Co-Ral) 25.0Z WP	___ Yes ___ No	_____	_____
	diazinon 50.0Z WP	___ Yes ___ No	_____	_____
	dioxathion (Delnav) 30.0Z EC	___ Yes ___ No	_____	_____
	ronnel (Korlan) 2.5Z pressurized	___ Yes ___ No	_____	_____
	<u>SMEAR</u> ronnel (Korlan) 0.5Z EC	___ Yes ___ No	_____	_____

Remarks: If this material was used to control another insect, indicate here.

Pests	Material and Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control another insect, indicate here.
LICE	<u>SPRAYS</u> coumaphos (Co-Ral) 11.6% EC	___ Yes ___ No	_____	_____
	25.0% WP	___ Yes ___ No	_____	_____
	crotoxyphos (Cioldrin) 14.4% EC	___ Yes ___ No	_____	_____
	crotoxyphos and dichlorvos (Ciovap) 12.5% EC	___ Yes ___ No	_____	_____
	dioxathion (Delnav) 30.0% EC	___ Yes ___ No	_____	_____
	lindane 25.0% WP	___ Yes ___ No	_____	_____
	malathion (Cythion) 57.0% EC	___ Yes ___ No	_____	_____
	25.0% WP	___ Yes ___ No	_____	_____
	methoxychlor (Marlate) 50.0% WP	___ Yes ___ No	_____	_____
	ronnel (Korlan) 24.0% E	___ Yes ___ No	_____	_____
	tetrachlorvinphos (Rabon) 50.0% WP	___ Yes ___ No	_____	_____
	<u>SPRAYS</u> toxaphene-lindane 45.1% EC	___ Yes ___ No	_____	_____
	<u>POUR-ONS</u> fenthion (Tiguvon) 3.0%	___ Yes ___ No	_____	_____
	<u>GRANULES</u> ronnel (Korlan) 5.0%	___ Yes ___ No	_____	_____
	<u>DUSTS</u> coumaphos (Co-Ral) 1.0%	___ Yes ___ No	_____	_____
	crotoxyphos (Cioldrin) 3.0%	___ Yes ___ No	_____	_____
	malathion (Cythion) 4.0%	___ Yes ___ No	_____	_____
	5.0%	___ Yes ___ No	_____	_____
	methoxychlor (Marlate) 50.0% WP	___ Yes ___ No	_____	_____
	tetrachlorvinphos (Rabon) 3.0%	___ Yes ___ No	_____	_____
	<u>DUSTS</u> toxaphene 5.0%	___ Yes ___ No	_____	_____
MANGE	<u>SPRAYS</u> lindane 25.0% WP	___ Yes ___ No	_____	_____
	malathion (Cythion) 57.0% EC	___ Yes ___ No	_____	_____
	25.0% WP	___ Yes ___ No	_____	_____
	<u>DIP</u> lindane 25.0% WP	___ Yes ___ No	_____	_____
	toxaphene 61.0% EC	___ Yes ___ No	_____	_____

## POULTRY

Pests	Material and Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control another insect, indicate here.
CHICKEN MITES	<u>MIST SPRAYS</u>			
LICE	carbaryl (Sevin)	___ Yes ___ No	_____	_____
NORTHERN FOWL MITES	50.0Z WP	___ Yes ___ No	_____	_____
	80.0Z S	___ Yes ___ No	_____	_____
	4.0Z Flowable	___ Yes ___ No	_____	_____
	naled (Dibrom)			
	36.0Z EC	___ Yes ___ No	_____	_____
	Rabon & Vapona (Ravap) 28.7Z EC	___ Yes ___ No	_____	_____
	tetrachlorvinphos (Rabon) 50.0Z WP	___ Yes ___ No	_____	_____
	24.0Z EC	___ Yes ___ No	_____	_____
	<u>COARSE SPRAYS</u>			
	carbaryl (Sevin)			
	50.0Z WP	___ Yes ___ No	_____	_____
	80.0Z S	___ Yes ___ No	_____	_____
	4.0Z Flowable	___ Yes ___ No	_____	_____
	malathion (Cythion)			
	25.0Z WP	___ Yes ___ No	_____	_____
	57.0Z EL	___ Yes ___ No	_____	_____
	<u>DUSTS</u>			
	carbaryl (Sevin)			
	5.0Z Dust	___ Yes ___ No	_____	_____
	malathion (Cythion)			
	4.0Z Dust	___ Yes ___ No	_____	_____
	5.0Z Dust	___ Yes ___ No	_____	_____
	tetrachlorvinphos (Rabon) 3.0Z	___ Yes ___ No	_____	_____
	<u>DUST BOXES</u>			
	carbaryl (Sevin)			
	5.0Z Dust	___ Yes ___ No	_____	_____
	tetrachlorvinphos (Rabon) 50.0Z WP	___ Yes ___ No	_____	_____
LICE	<u>COARSE SPRAYS</u>			
NORTHERN FOWL MITES	coumaphos (co-Ral)			
	25.0Z WP	___ Yes ___ No	_____	_____
	<u>TAIL-DIPPING</u>			
	malathion (Cythion)			
	57.0Z EL	___ Yes ___ No	_____	_____
	<u>DUST BOXES</u>			
	malathion (Cythion)			
	4.0Z Dust	___ Yes ___ No	_____	_____
	5.0Z Dust	___ Yes ___ No	_____	_____

Pests	Material and Formulation	Was Material Used?	Amount Purchased and Used in 1979	Remarks: If this material was used to control an insect, indicate here.
BLACK FLIES DEER FLIES FACE FLIES GNATS HORN FLIES MOSQUITOES PUNKIES STABLE FLIES	<u>SPRAYS</u> pyrethrins— synergised 0.05 to 0.1%  0.5% to 1.0%	___ Yes ___ No  ___ Yes ___ No	_____ _____	_____ _____
HORN FLIES STABLE FLIES LICE	<u>SPRAYS</u> lindane 25.0% WP  toxaphene 43.4%  toxaphene and lindane 1.7%	___ Yes ___ No  ___ Yes ___ No  ___ Yes ___ No	_____ _____ _____	_____ _____ _____
 LICE				
HORN FLIES LYCE	<u>SPRAYS</u> coumaphos (Co-Ral) 11.5% EC  malathion (Cythion) 57.0% EC  25.0% WP  <u>DUSTS</u> malathion (Cythion) 4.0%	___ Yes ___ No  ___ Yes ___ No  ___ Yes ___ No  ___ Yes ___ No	_____ _____ _____ _____ _____	_____ _____ _____ _____ _____
 HORN FLY				
HORN FLIES	<u>DUSTS</u> malathion (Cythion) 5.0%  coumaphos (Co-Ral) 1.0%	___ Yes ___ No  ___ Yes ___ No	_____ _____	_____ _____
DEER FLIES HORN FLIES HORSE FLIES HOUSE FLIES MOSQUITOES STABLE FLIES	<u>OIL BASE WIPE-ON OR SPRAY</u> tetrachlorvinphos (Rabon) 1.0%  pyrethrum 0.09%  piperonyl butoxide 0.18% and repellent 10.0%	___ Yes ___ No  ___ Yes ___ No  ___ Yes ___ No	_____ _____ _____	_____ _____ _____
BITING GNATS FACE FLIES HOUSE FLIES STABLE FLIES	<u>GEL WIPE-ON</u> tetrachlorvinphos (Rabon) 2.0%  pyrethrum 0.09%  piperonyl butoxide 0.18% and repellent 10.0%	___ Yes ___ No  ___ Yes ___ No  ___ Yes ___ No	_____ _____ _____	_____ _____ _____
MANGE (mites)	<u>SPRAYS</u> lindane 25.0% WP	___ Yes ___ No	_____	_____
HORSE BOTTS	<u>FEED ADDITIVES</u> dichlorvos (Horse wormer)  trichlorfon (Anthon) 90.0% powder	___ Yes ___ No  ___ Yes ___ No	_____ _____	_____ _____

Long Residual Sprays

	<u>Was Material Used?</u>	<u>Amount Purchased and Used in 1979</u>
Chlorfenvinphos (Copper Residual Surface Spray) 21.1% EC	___ Yes ___ No	_____
Dimethoate (Cygon) 23.4% EC	___ Yes ___ No	_____
Fenthion (Baytex) 93.0% EC	___ Yes ___ No	_____
Ronnel (Korlan) 24.0% EC	___ Yes ___ No	_____
Tetrachlorvinphos (Rabon) 50.0% WP	___ Yes ___ No	_____
Tetrachlorvinphos Plus Dichlorvos (Ravap) 28.3% EC	___ Yes ___ No	_____

Medium Residual Sprays

Diazinon 50.0% WP	___ Yes ___ No	_____
Dylox 80.0% SP	___ Yes ___ No	_____
Malathion (Cythion) 57.0% EC	___ Yes ___ No	_____
Methoxychlor (Marlate) 50.0% WP	___ Yes ___ No	_____
Crotoxyphos and Dichlorvos (Ciovap) 12.5% EC	___ Yes ___ No	_____

Short Residual Sprays

Dichlorvos (Vapona) 23.4% EC	___ Yes ___ No	_____
Naled (Dibrom) 36.0% EC	___ Yes ___ No	_____
Pyrethrins .1 - .2%	___ Yes ___ No	_____

Resin Strips

DDVP-Dichlorvos (Vapona)	___ Yes ___ No	_____
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Space or Aerosol Spray (Foggers)

	<u>Was Material Used?</u>	<u>Amount Purchased and Used in 1979</u>
Dichlorvos (Vapona) 23.4% EC	___ Yes ___ No	_____
Naled (Dibrom) 1.0% Ready to Use Formulation	___ Yes ___ No	_____
Pyrethrins .1 - .2%	___ Yes ___ No	_____

Baits

Diazinon 50.0% WP	___ Yes ___ No	_____
Dichlorvos (Vapona) 23.4% EC	___ Yes ___ No	_____
Malathion (Cythion) 57.0% EC	___ Yes ___ No	_____
Naled (Dibrom) 36.0% EC	___ Yes ___ No	_____
Ronnel (Korlan) 24.0% E	___ Yes ___ No	_____
Trichlorfon (Dipterex, Dylox, Naguvon) 1.0%	___ Yes ___ No	_____

Oral Larvicides

Tetrachlorvinphos (Rabon) 50.0% WP	___ Yes ___ No	_____
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Manure Drenches

Dimethoate (Cygon) 2.0% E	___ Yes ___ No	_____
Dichlorvos (Vapona) 23.4% EC	___ Yes ___ No	_____
Malathion (Cythion) 57.0% EC	___ Yes ___ No	_____
Tetrachlorvinphos (Rabon) 50.0% WP	___ Yes ___ No	_____
Tetrachlorvinphos and Dichlorvos (Ravap) 28.3% EC	___ Yes ___ No	_____



1. How many animals do you have in your operation?

	<u>Feed Lot or Confined Housing</u>	<u>Pasture or Range</u>	<u>Total</u>
Dairy Cattle	_____	_____	_____
Beef Cattle	_____	_____	_____
Swine	_____	_____	_____
Sheep	_____	_____	_____
Poultry	_____	_____	_____
Horses	_____	_____	_____

2. How would you rate the effectiveness of your livestock control program?

Excellent	_____	Fair	_____
Good	_____	Poor	_____

3. What is your most serious livestock insect pest? \_\_\_\_\_

4. Are you or any other person in your operation a certified pesticide applicator?

Yes \_\_\_\_\_ No \_\_\_\_\_

5. Pesticide Storage: Which of the following conditions describes your facilities and procedures for pesticide storage? (Circle all appropriate numbers.)

- 1 Stored in a separate building
- 2 Stored in a building housing other materials
- 3 Separated by a barrier from other materials in the building
- 4 Kept under locked storage
- 5 Storage area is fireproof
- 6 Storage area has facilities for fire protection
- 7 Storage area has facilities for temperature control
- 8 Storage area has facilities for air movement
- 9 Storage area has provisions for separation and segregation of different pesticide materials
- 10 Storage area is equipped with isolated drainage system
- 11 Storage area is accessible only to authorized personnel
- 12 Pesticides are sometimes stored in other than the original container

Comments: \_\_\_\_\_  
\_\_\_\_\_

6. Disposal of Surplus Pesticides: What procedures are used in disposal of surplus pesticides? (Circle all appropriate numbers.)

- 1 Surplus pesticide stored for use in next season
- 2 Surplus pesticide returned to dealer
- 3 Surplus pesticide applied for some other labelled use
- 4 Surplus pesticide diluted and sprayed over isolated area
- 5 Surplus pesticide buried in an isolated area
- 6 Surplus pesticide burned or incinerated
- 7 Surplus pesticide disposed of in a landfill operation
- 8 Surplus pesticide disposed of by a commercial waste disposal company
- 9 Surplus pesticide disposed of in environmental, municipal, or public drainage systems

Comments: \_\_\_\_\_  
\_\_\_\_\_

7. Pesticide Container Disposal: Which of the following practices are used in disposing of pesticide containers? (Circle all appropriate numbers.)

- 1 Metal and plastic containers are decontaminated by the triple rinse or simple procedure
- 2 Combustible containers are burned on premises
- 3 Containers are buried on premises
- 4 Containers disposed of in sanitary landfill facilities
- 5 Large containers are returned to the dealer or manufacturer
- 6 Containers are disposed of through barrel reclaimers, etc.
- 7 Containers are disposed of through commercial waste disposal companies
- 8 Containers are sometimes used for other purposes on the premises or by others
- 9 Containers accumulate on premises
- 10 Containers are dumped at out-of-the-way places
- 11 Containers are stored for future disposal
- 12 Storage facilities for empty containers are similar to or the same as that for pesticide storage and are kept locked

Comments: \_\_\_\_\_

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What Factors Do You Consider to Be Most Important in the Selection of a Chemical?

8. Information Source (Rank in order of importance; i.e., 1, 2, 3)

- \_\_\_\_\_ A. Recommendation of dealer
- \_\_\_\_\_ B. Recommendation of neighbor
- \_\_\_\_\_ C. Recommendation of extension agent
- \_\_\_\_\_ D. Advertisements from companies, radio, TV
- \_\_\_\_\_ E. Personal experience

9. Economic Factors (Circle most important.)

- A. Cost per unit treated
- B. Compatibility with existing equipment

10. Personal Hazard Factors (Given the choice between two chemicals with equal control potential, indicate the criteria you would use to make your choice.)

Rank in order of importance.

- \_\_\_\_\_ A. Choice of chemical with lower toxicity
- \_\_\_\_\_ B. Choice of chemical requiring less personal protection
- \_\_\_\_\_ C. Choice of chemical not requiring applicator certification
- \_\_\_\_\_ D. Deciding factor is satisfactory pest control--toxicity of chemical is of secondary consideration
- \_\_\_\_\_ E. Choice of chemical with short treatment to slaughter day waiting time
- \_\_\_\_\_ F. Choice of chemical with prolonged control





Cooperative Extension Service  
The Ohio State University

Entomology  
1735 Neil Avenue  
Columbus, Ohio 43210  
Phone 614 422-5274

April 15, 1980

Dear Livestock and/or Poultry Producer:

About a month ago we mailed to you a questionnaire requesting your assistance in compiling information relative to pesticide use for Ohio livestock and/or poultry. We have received favorable response from many producers, but we do need your response as well in order to derive satisfactory data. In this period of time when the justification for pesticide registration and use is too often based on the balance between the essential needs and quantity of use versus the political, public, and environmental contentions against such use, it is vitally necessary that we have available reliable scientific data. That includes the need for data on essential pesticide needs and consequent quantities used. Thus we have come to you, the producer, as the best source of actual use information. These data will be important for the Cooperative Extension Service, Agricultural Research and USDA in defending essential pesticide needs when registration reviews require such. Thus we do need your cooperation. We do realize that in some cases the mailing lists used may have been outdated and that you may not now be involved in livestock production. If that is the case, please so inform us.

If you still have the survey questionnaire that you received in March, will you take the few minutes necessary to check off the information and return it to us in the self-addressed postage paid envelope that was included. We attempted to make the survey such that it would require only a minimum of your time. Recommended pesticide formulations and other questions were listed that for the most part required only checking the answer and providing the quantity purchased and/or used in 1979. If you do not now have the survey questionnaire, we ask that you answer the questions on the enclosed sheet and mail it to us at the earliest date possible. Please provide answers to all the questions that are applicable and if you produce more than one type of livestock, indicate the pesticide usage that applies to each type. If you did not use pesticides, indicate such on the questionnaire, but still provide the information on the number of animals in your operation.

We appreciate your response. Thank you.

Yours truly,

*Ted L. Jones*  
Ted L. Jones  
Assistant Director  
Agricultural Industry

*Acie C. Waldron*  
Acie C. Waldron  
Coordinator NCRPIAP and  
Ohio PIAP Liaison Coordinator

## APPENDIX 2.

Please mail the following information to: Dr. Acie C. Waldron  
 Pesticide Impact Assessment Program  
 Ohio State University  
 1735 Neil Avenue  
 Columbus, OH 43210

1. How many animals did you have in your operation for 1979 and were they confined or on open pasture?

Dairy\_\_\_\_\_ Beef\_\_\_\_\_ Swine\_\_\_\_\_ Sheep\_\_\_\_\_ Poultry\_\_\_\_\_ Horses\_\_\_\_\_

2. What is your most serious insect problem with each type of livestock listed above? (Grubs, Face flies, Horn flies, House flies, Stable flies, Mosquitos, Lice, Chicken mites, Northern fowl mites, Horse flies, Gnats, Deer flies, Black flies, Horse bolts, Mange, Ticks, Wool maggots).

3. Did you use pesticides for control of the insect pests?

4. If you used pesticides for insect control on any type livestock or poultry operation indicated above, provide the following information:

- a. Pesticide use on livestock or poultry: (1) List the names and (2) the quantities of pesticides purchased and/or used in 1979, and (3) the type of formulation or method of application.

NOTE: (1) List the pesticide by trade or common name and, if known, the percent of active ingredient in the formulation (examples: Malathion 25% WP, Malathion 57% EC, etc.); (2) The quantity purchased and/or used should be expressed by volume (gallons, quarts, pints, ounces, etc.), by weight (pounds, ounces, etc.) or by number (resin strips, packages, blocks, etc.); (3) The formulations or methods of application include sprays, pour-on, feed additives, backrubbers, facerubbers, dusts, dust bags, smears, ear tags, spot-on, dipping, granules, wipe-ons, etc.

- b. Pesticide use on livestock and poultry buildings and shelters: (1) List the names and (2) quantities of pesticides purchased and/or used in 1979, and (3) the types of formulation or method of application.

NOTE: See note (1) and (2) in "a" above for procedures in recording names and quantities. (3) Types of formulations or methods of application include sprays, resin strips, aerosols, foggers, baits, oral larvicides, manure drenches, etc.

## APPENDIX 2. (continued)

5. How would you rate the effectiveness of your livestock insect control program?  
Excellent\_\_\_\_\_ Good\_\_\_\_\_ Fair\_\_\_\_\_ Poor\_\_\_\_\_
6. If you use protective clothing or devices in applying pesticides, what articles of equipment did you use with what pesticides? (None, Face Shield, Rubber or Neoprene Gloves, Rubber or Neoprene Apron, Rubber or Neoprene Boots, Water Resistant Spray Suit, Gas Mask or Respirator, Washable Head Covering).
7. What facilities do you utilize for pesticide storage and are there special provisions and precautions observed in storage? (i.e., separate building, separation of material, locked and secured, accessible only to authorized personnel, fireproof, air movement and temperature control, material kept in original container, etc.).
8. How do you dispose of surplus pesticides, if necessary? (Burial, burning, return to dealer, used for some other purpose, landfill, commercial waste disposal company, stored for future use, public damage and sewer systems, etc.)
9. How do you dispose of empty containers?
10. What information sources do you use for Pesticide Use Recommendations ranked in order of importance? (Extension service, dealers, personal experience, neighbors, media advertisements).
11. What factors are considered in the selection of a pesticide formulation for control of your livestock pest problems? (i.e., cost or compatibility with existing equipment, lower toxicity of the chemical; duration of pest control--prolonged vs. short time, requirements for personal protection and/or applicator certification, etc.).
12. Are you or any other person involved in your livestock operation a certified pesticide applicator?  
Yes\_\_\_\_\_ No\_\_\_\_\_

## APPENDIX 3. Glossary of Pesticides by Common and Trade Names.

<u>COMMON NAME</u>	<u>TRADE NAME<sup>a/</sup></u>
Carbaryl	SEVIN
Chlorfenvinphos	COPPER RESIDUAL SURFACE SPRAY
Coumaphos	CO-RAL
Crotoxyphos	CIODRIN
Crotoxyphos + Dichlorvos	CIOVAP
Crufomate	RUELENE
Diazinon	DIAZINON
Cichlorvos	VAPONA, DDVP
Dimethoate	CYGON
Dioxathion	DELNAV
Famphur	WARBEX
Fenthion	BAYTEX, LYSOFF, SPOTTEN, TIGUVON
Lindane	LINDANE
Malathion	CYTHION
Methoxychlor	MARLATE
Naled	DIBROM
Nicotine	BLACK LEAF 40
Phosmet	PROLATE
Pyrethrin	PYRETHRIN
Ronnel	KORLAN
Tetrachlorvinphos	RABON
Tetrachlorvinphos + Dichlorvos	RAVAP
Tetrachlorvinphos + Pyrethrin	
Trichlorfon	ANTHON, DYLOX, NEGUVON
Toxaphene	TOXAPHENE
Toxaphene + Lindane	

<sup>a/</sup>Trade names listed are those from the OCES Bulletins 473 and L-256 and/or those used by respondents to the surveys. Inclusion of the trade name does not constitute endorsement of the product nor does omission of other trade names intend any discrimination.