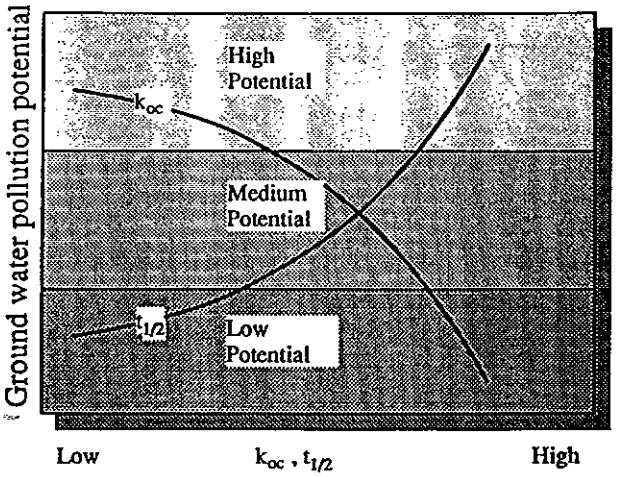
# Application of B.M.P. for Prevention of Ground-Water Contamination




by

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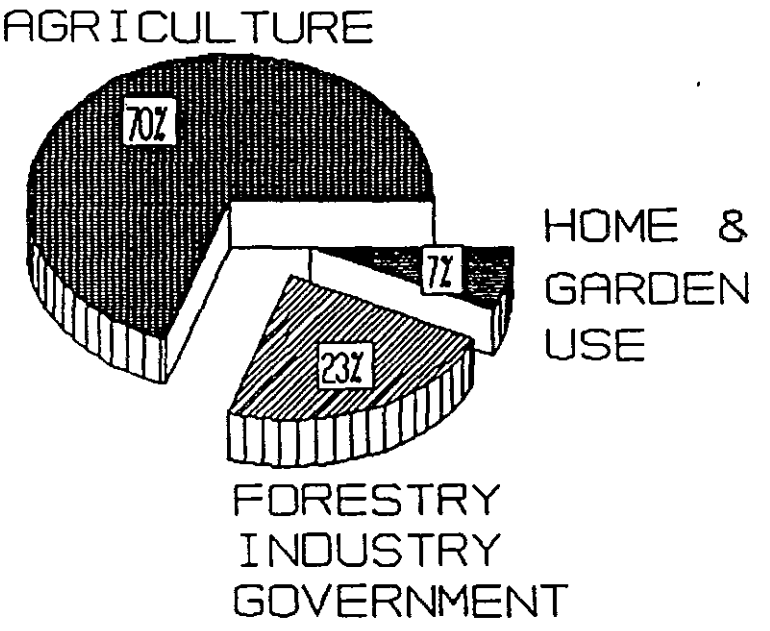
## Introduction

The use of pesticides is an integral part of today's agriculture. In many cases, pesticides safeguard crops from severe pest infestation, or increase yield by suppressing competing weed growth. Pesticides often make the difference between profits and losses in farming operations. However, pesticides, even in extremely low concentrations, can pose a risk to human health and to the environment. Applied to plant or soil surfaces, or injected into the soil, pesticides may leach to the ground water or may be washed off with surface water. Pesticide contaminated surface water can reach ground water, or contaminated ground water can reach the surface and contribute to surface water pollution. Once in the ground water, pesticides can persist for years, rendering the water unsuitable for human and animal consumption. Effectively treating drinking water to reduce pesticide residues to acceptable levels or to restore ground-water quality can be difficult and expensive.

Organic and inorganic chemicals used as pesticides include: insecticides, herbicides, fungicides rodenticides, fumigants, disinfectants, plant growth regulators and other related substances. At the present, about 45,000 pesticides products are marketed in the U.S. Environmental Protection Agency (EPA) estimates that about 70 percent of all pesticides used in the country are applied in agricultural production, 7 percent in home and garden settings, and the remaining 23 percent in forestry, industry and government programs.

# PESTICIDE SALES IN U.S.

(Total Sales in 1986: 1.2 Billion Pounds)



## Health Risk and Health Advisory

Public concern about pesticides and their affects on human health are thriving, but how do pesticides really effect us? Two different health effects may be distinguished:

1. Short-term exposure to relatively high doses of various pesticides may induce an acute poisoning; and
2. Long term exposure to trace concentrations (a few parts per billion or even per trillion) in food, drinking water or the general environment, may induce chronic health effects.

Nowadays, concern is mainly focusing on the effects of long term exposure. Cancer, mutations, birth defects, and immunological changes are mentioned as possible effects of long term low level exposure. However, it is essential to indicate that the mere presence of trace concentrations does not necessarily present an unreasonable risk. USEPA (1987) mentions in its proposed pesticide strategy:

> "The level of risk posed by pesticide residues is dependent upon the levels and duration of human exposures to residues of pesticide and the toxicological significance of such exposure".

If a certain level of risk can be defined as acceptable, then it is possible to formulate health advisories. These advisories may indicate the pesticide concentration that can be consumed during a certain time period without anticipation of adverse health effects.

The Office of Drinking Water of the Environmental Protection Agency currently provides health advisories for 60 pesticides. This office developed one-day, ten-day, long term (approximately 7 years) and lifetime exposure limits based on non-carcinogenic end points of toxicity. For the chemicals that are

known or probable carcinogens, concentration values are correlated with carcinogenic risk estimates. The acceptable risk is set at a level of $10^{-6}$, this means that at the given level of exposure, one person in a million might contract cancer if exposed for his entire lifetime to the level given by the health advisory (USEPA Office of Drinking Water, 1987). Table 4 provides a listing of the Office's lifetime health advisories. The data in Table 4 currently have non-regulatory status. However, EPA may declare these values as Maximum Contamination Levels (MCL's), which are enforceable standards as defined under the Safe Drinking Water Act.

After carefully analyzing the calculation of health advisories, one may notice that considerable judgement is involved in defining acceptable risk and acceptable contamination levels (e.g. extrapolation of results gained from laboratory tests with animals, selection of safety factors, definition of carcinogenic risk). Rao (1988) comments on this point and the formulation of regulatory guidelines:

> "Risk assessment is judgement based on scientific data and provides a rational basis for quantifying the hazards of groundwater contamination. Risk management usually involves social, legal, economic, and political considerations. If a given level of excess risk is determined to be acceptable, especially in comparison with other risks that may be greater but are usually taken for granted in every-day life, then appropriate regulatory guidelines for preventing or minimizing groundwater contamination can be developed".

TABLE . Lifetime Health Advisory (USEPA Office of Drinking Water, 1987)

| Chemical Name | Cancelled or Severely Restricted | Health Advisory Level** (ppb) |
|---|---|---|
| 1,2-D | Y | 0.0013 * |
| 1,3-D | | 0.20 * |
| 2,4,5-T | Y | 21 |
| 2,4-D | | 70 |
| 2,4-DB | | |
| Alachlor | | 1.5 * |
| Aldicarb | | 10 |
| Aldrin | | |
| Arsenic | Y | |
| Atraton | | |
| Atrazine | | 3.0 |
| BHC | Y | |
| Bromacil | | 80 |
| Carbofuran | | 36 |
| Chlordane | Y | 0.03 * |
| Chlorothalonil | | 1.5 * |
| Cyanazine | | 9.0 |
| DBCP | Y | 0.02 * |
| DDT | | |
| Dacthal/DCPN | | 3500 |
| Diazinon | | 0.63 |
| Dicamba | | 9.0 |
| Dieldrin | Y | 0.00219 * |
| Dinoseb | Y | 7.0 |
| Diuron | | 14 |
| EDB | Y | 0.0005 * |
| Endosulfan | | |
| Endrin | Y | 0.032 |
| Ethoprop | | |
| Fonofos | | 14 |
| Heptachlor | Y | 0.076 * |
| Hexazinone | | 210 |
| Lindane | Y | 0.026 * |
| Linuron | | |
| Malathion | | |
| Methamidophos | | |
| Methomyl | | 175 |
| Methyl parathion | | 2.0 |
| Metolachlor | | 10 |
| Metribuzin | | 175 |
| Oxamyl | | 175 |
| PCNB | | |
| PCP | | 220 |
| Parathion | | |

TABLE . Lifetime Health Advisory (cont.)

| Chemical Name | Cancelled or Severely Restricted | Health Advisory Level** (ppb) |
|---|---|---|
| Picloram | | 490 |
| Prometon | | 100 |
| Propazine | | 14 |
| Silvex | Y | 52 |
| Simazine | | 35 |
| Sulprofos | | |
| TDE | Y | 0.031 |
| Toxaphene | Y | |
| Triallate | | |
| Trifluralin | | 2.0 |

* Lifetime exposure levels based on a $10^{-6}$ risk of causing cancer

** Proposed Lifetime Health Advisory Level

**Facts About Ground-Water Contamination:**

Nitrates and pesticides the chemical concern in ground water contamination by agriculture. These chemicals causes cancer, nervous system disorder, birth defects and male sterility.

Nitrate-Nitrogen concentration in vadose zone water typically is in the range of 5 to 100 mg/l. The maximum limit for drinking water is 10 mg/l. The excess of Nitrate in drinking water would cause disease like Blue-Baby or Malignant Tumors.

EPA reported the number of wells affected nation-wide is about 45,000 which 5,500 of them having harmful pesticides and another 5,500 having 73 different pesticides. The movement of pesticides follow the Darcy's low.

$$\text{Darcy's law, } q = -K \, \delta h / \delta x$$

$$\text{Saturated velocity is } = q / n$$

$$\text{Unsaturated velocity } = q / \theta_v$$

where:

$q$ = flux, and $K$ = hydraulic conductivity, $n$ = porosity, $h$ = potential head, $x$ = distance, and $\theta_v$ is soil water content. The Darcy's velocity is the same as linear pore velocity or molecular velocity. This velocity is applied to those chemicals not adsorbed by the soil or organic matter (nitrate). But pesticides will be adsorbed or volatilized in the vadose zone. The retardation factor permits calculation of time required for a given pesticide to move to underlying ground water.

$$\text{Retardation Factor} = \text{Water Velocity} / \text{Pesticide Velocity}$$

Solutions:

Solution should be a balance between public health and environmental and economical concern. The cost of the prevention is cheaper than the clean up. For doing prevention, first step is control of the source and initiation of best management practices (BMP).

Using the none leaching pesticides is one of the options. Leaching of the pesticides will increase with decreasing adsorption, decreasing the organic carbon, increasing the solubility, decreasing of volatility and decreasing of the half-life time of pesticides (Figure 4).

Examples of the Best Management Practices:

BMP's could be summed as:

(1). The most favorable action is to keep the pesticides in the root zone as long as possible. This will decrease the $t_{1/2}$ of the pesticide in the root zone, compare to deeper in vadose zone.

(2). Use of alternative pesticides with likelihood effect which are less mobil or leachables. Use slow release pesticides.

(3). Pesticides should not applied when heavy rain is expected or with an irrigation, unless irrigation is carefully controlled. Timing of the application.

(4). Control of irrigations by regulating the frequency and the amounts, and selection of proper design criteria. Like choosing the shorter furrow length in sandy soil, or bigger inflow (Qin) (Figures).

(5). Introduce natural enemies (lady bug), or use biological insect control.

(6). Develop more resistance crop variety.

(7). Early plow-down (cotton).

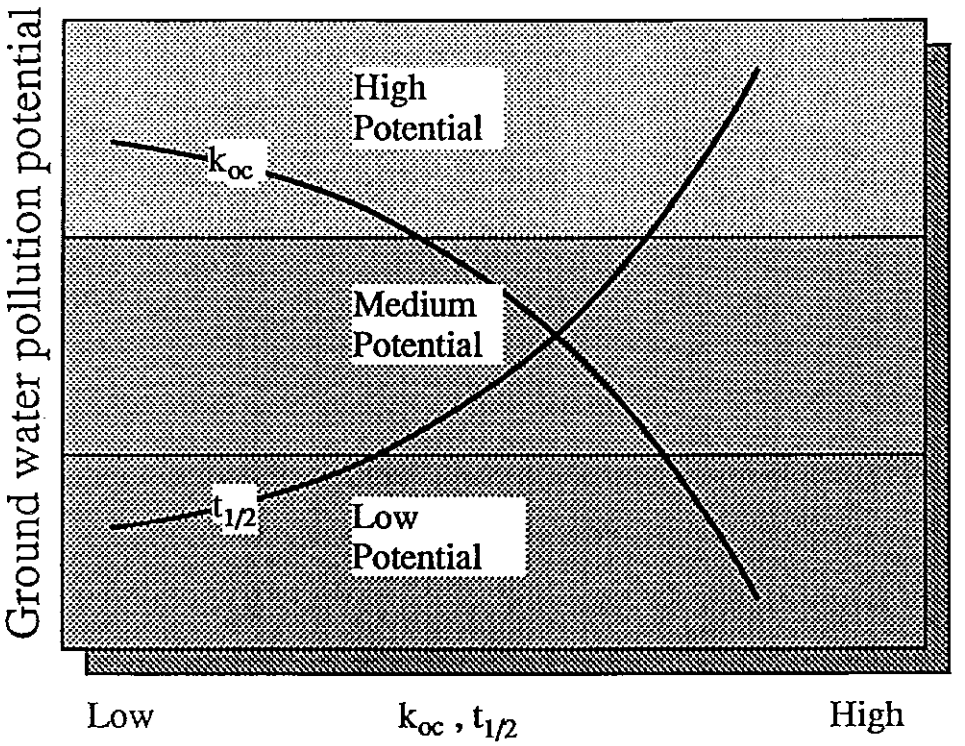
(8). Control the application techniques, (small percent of pesticide reaches its target with its present techniques)

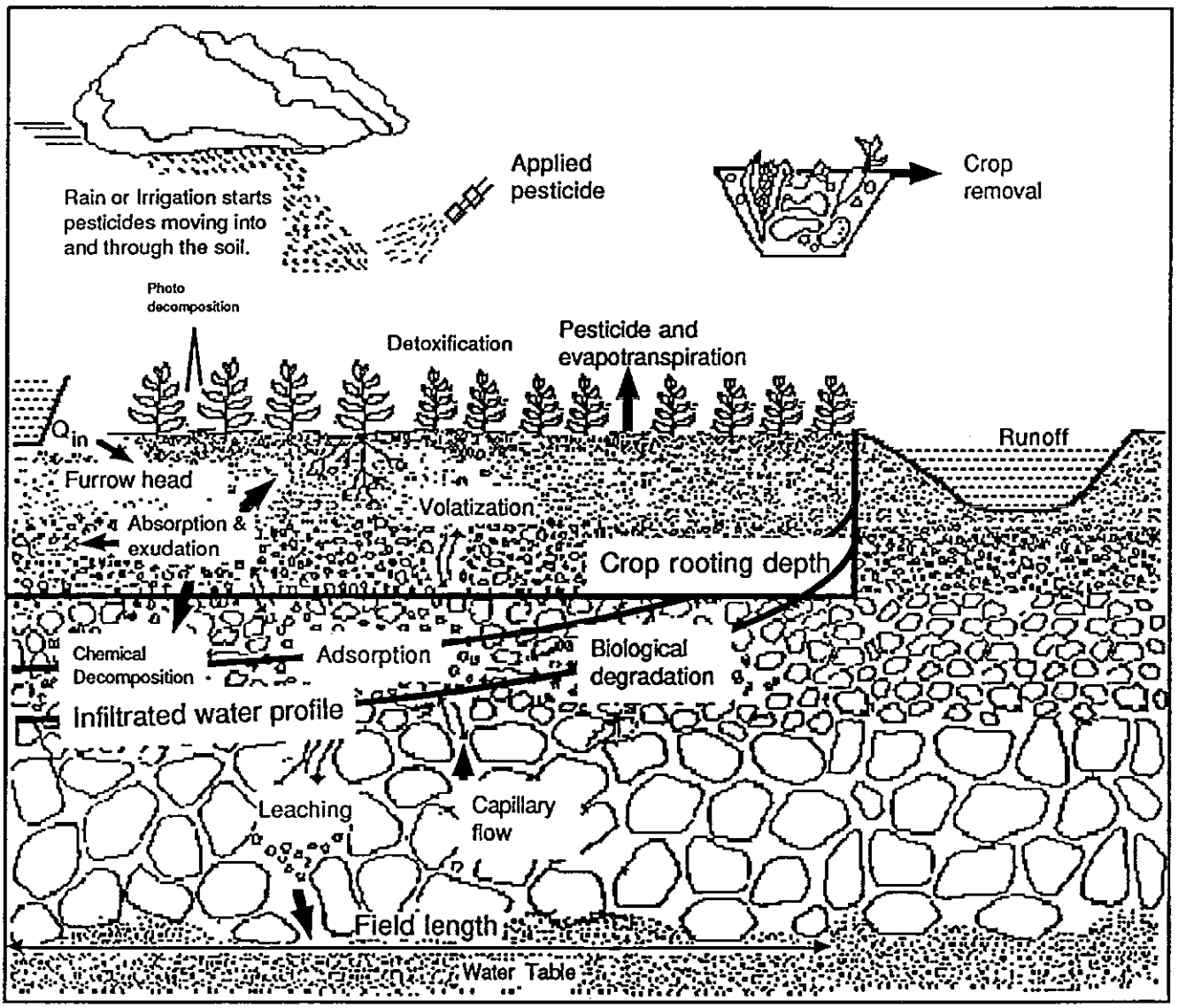
(9). In rainy climate nitrate leaches to ground water during fall and winter, planting a fall crop would be beneficial to remove residual nitrate from the vadose zone (soil).

**Moving Pesticides In Our Environment**

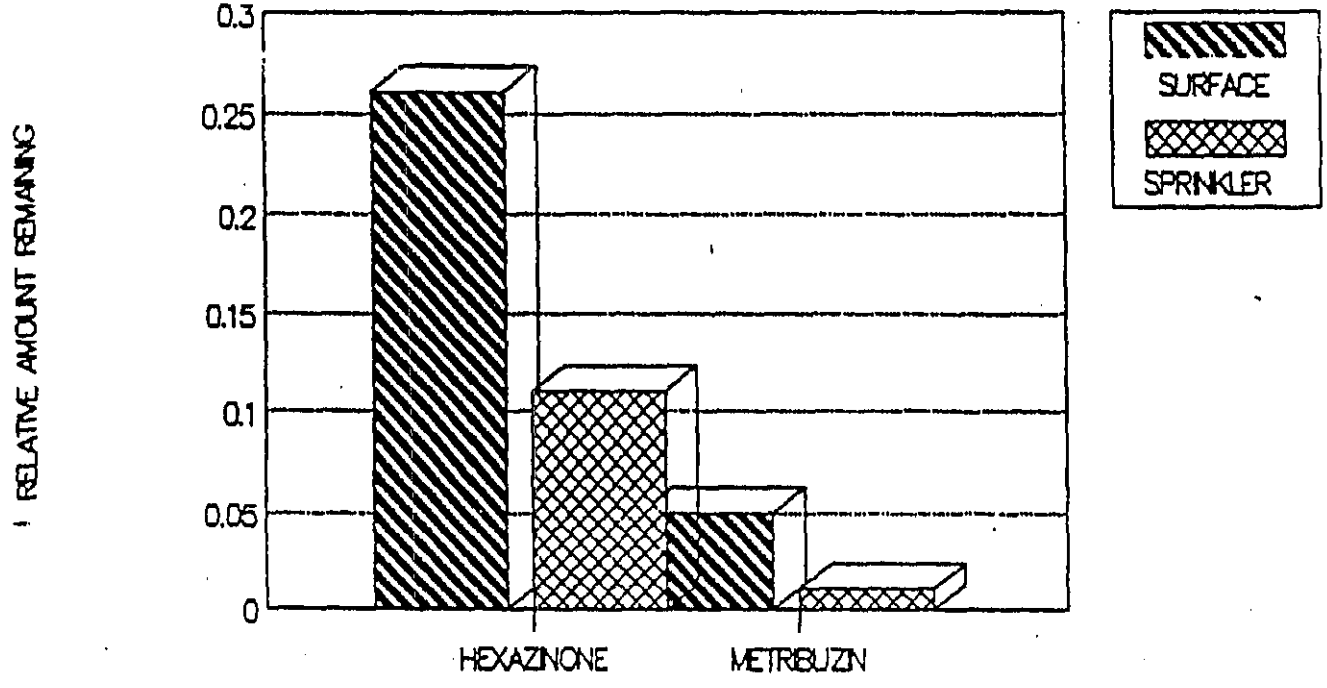
Even with putting all kind of afford to control the pesticides or any agricultural waste, still we might see the pesticides in the ground water. First the half-life deeper in the root zone may be a lot longer than determined for the root zone, second is the preferential flow (small holes made by worms or crop roots) is that the water and dissolved materials move 2 to 20 times faster than indicated by the Darcy's law. The high application of pesticides, preferential flow, decreases in the adsorption, and increases the $t_{1/2}$ Explains Why Even Immobile Pesticides Found In GROUND WATER.

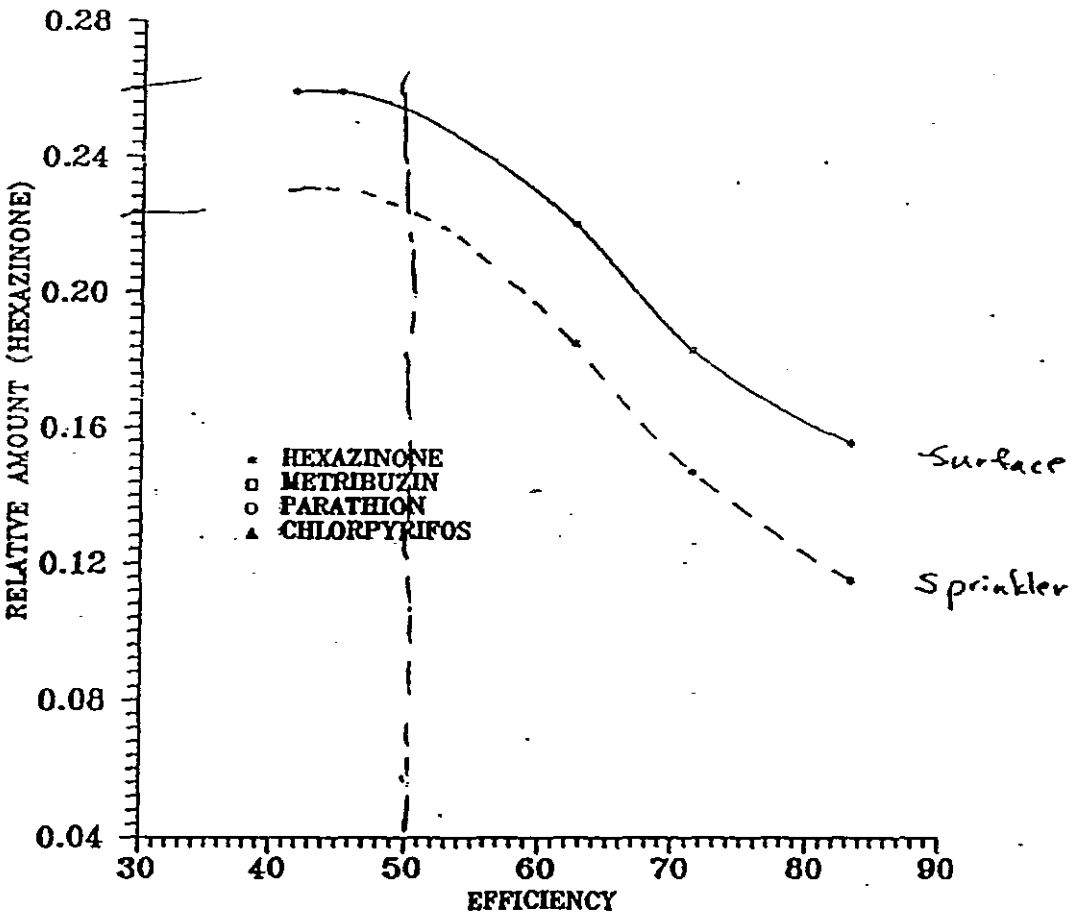
Ground water pollution by agricultural chemicals is a serious problem. It is needed to develop management practices for farmers (BMP's) to insure protection of the public health and environment as well as viable agriculture.

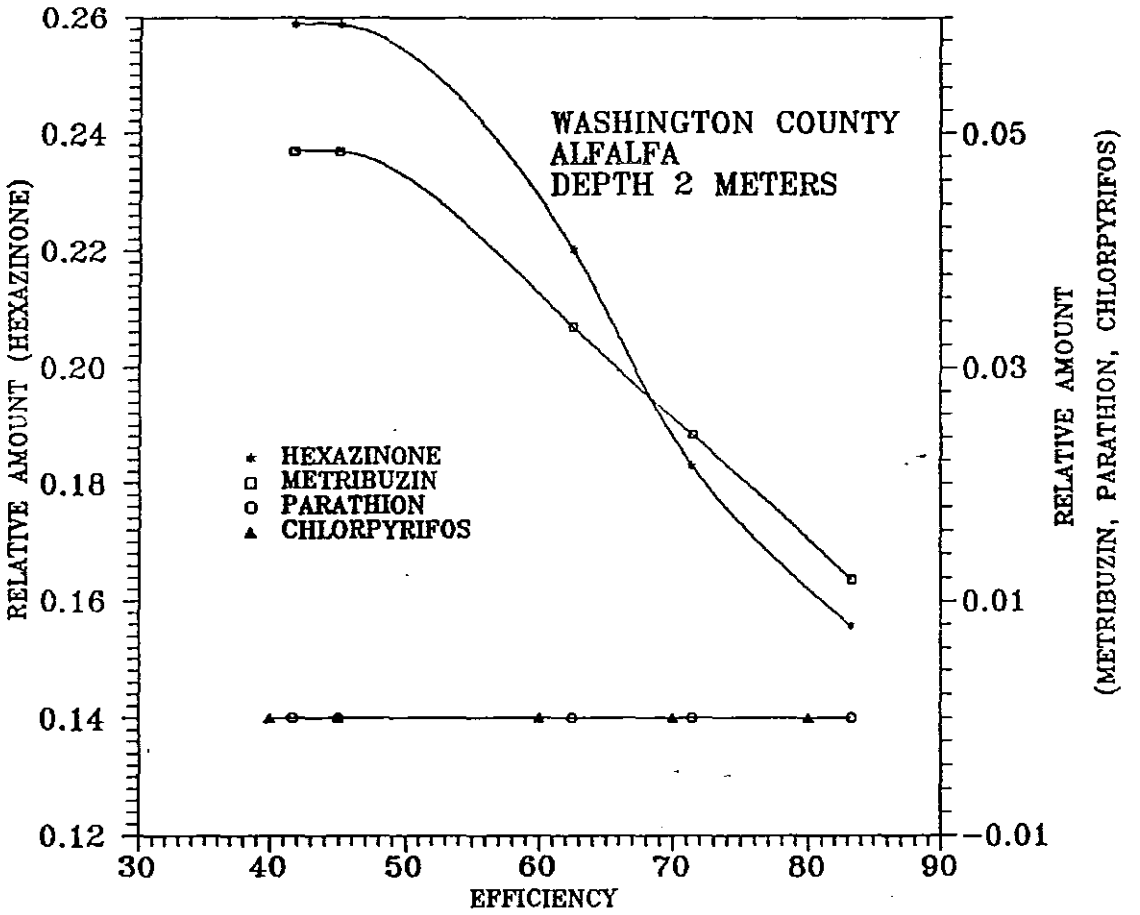

Ground water pollution potential
High Potential
$k_{oc}$
Medium Potential
$t_{1/2}$
Low Potential
Low
$k_{oc}$ , $t_{1/2}$
High

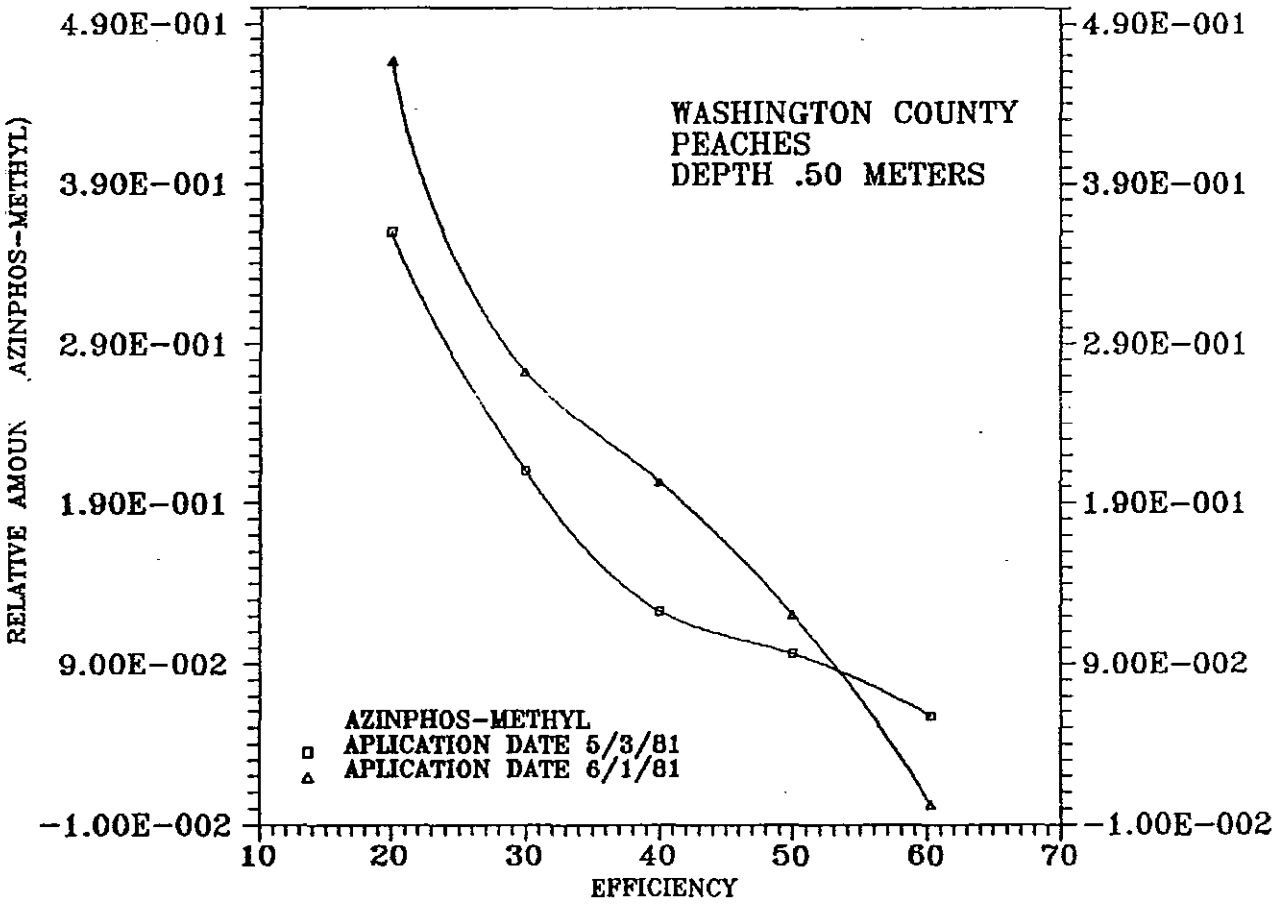

Rain or Irrigation starts pesticides moving into and through the soil.
Applied pesticide
Crop removal
Photo decomposition
Detoxification
Pesticide and evapotranspiration
$Q_{in}$
Furrow head
Runoff
Absorption & exudation
Volatization
Crop rooting depth
Chemical Decomposition
Adsorption
Biological degradation
Infiltrated water profile
Leaching
Capillary flow
Field length
Water Table

# EFFECT OF IRRIGATION SYSTEM SELECTION ON PESTICIDE MOVEMENT



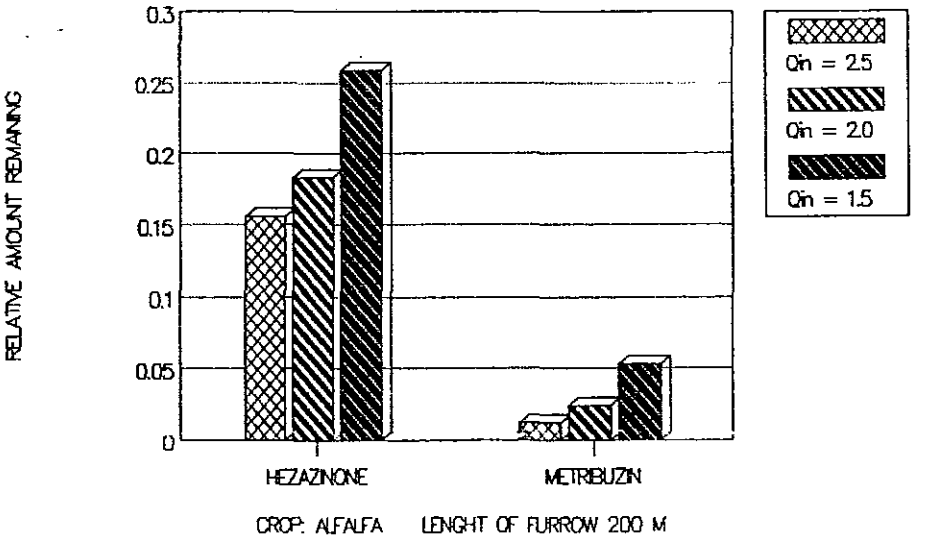

0.28
0.24
0.20
0.16
0.12
0.08
0.04
RELATIVE AMOUNT (HEXAZINONE)
HEXAZINONE
METRIBUZIN
PARATHION
CHLORPYRIFOS
30
40
50
60
70
80
90
EFFICIENCY
Surface
Sprinkler


WASHINGTON COUNTY
ALFALFA
DEPTH 2 METERS
HEXAZINONE
METRIBUZIN
PARATHION
CHLORPYRIFOS
RELATIVE AMOUNT (HEXAZINONE)
RELATIVE AMOUNT
(METRIBUZIN, PARATHION, CHLORPYRIFOS)
EFFICIENCY
0.26
0.24
0.22
0.20
0.18
0.16
0.14
0.12
0.05
0.03
0.01
-0.01
30
40
50
60
70
80
90


4.90E-001
3.90E-001
2.90E-001
1.90E-001
9.00E-002
-1.00E-002
RELATIVE AMOUN AZINPHOS-METHYL)
WASHINGTON COUNTY
PEACHES
DEPTH .50 METERS
AZINPHOS-METHYL
APLICATION DATE 5/3/81
APLICATION DATE 6/1/81
10
20
30
40
50
60
70
EFFICIENCY

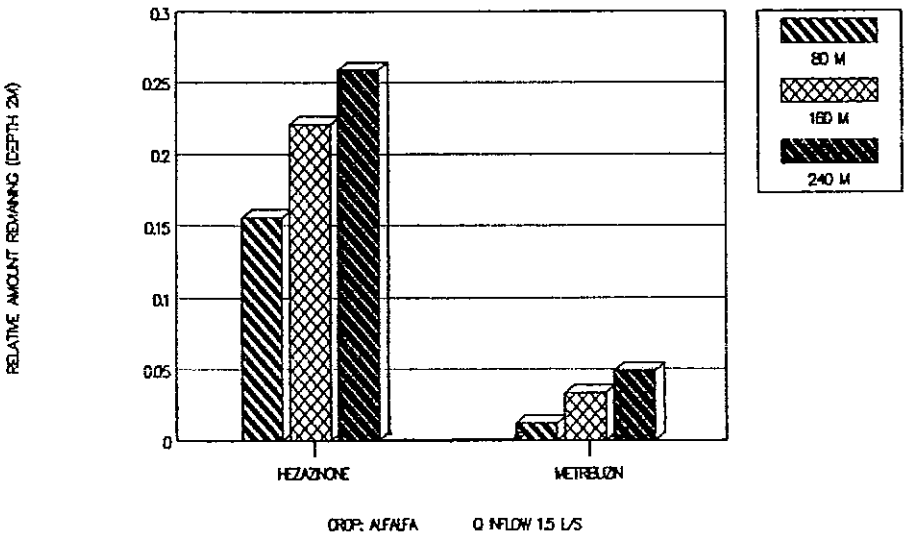
## *EFFECT OF Q INFLOW*

## *ON PESTICIDE MOVEMENT*



## *EFFECT OF FORROW LENGTH*

## *ON PESTICIDE MOVEMENT*



Assessing The Problem

Model Application

## Basic Concepts and Assumptions Used in the CMLS Model

The CMLS model integrates two basic concepts: (a) the movement of the chemical; and (b) the degradation of the chemical. In this model, chemicals move only in the liquid phase in response to soil-water movement. Water movement is calculated using a volume balance approach. Chemicals are exposed to adsorption processes and therefore advance in depth less far than water. A linear and reversible equilibrium adsorption model simulates the retardation of the chemical movement. The following equations are used to predict chemical movement:

$$dd_s = \frac{q}{R * T_{FC}} \tag{7}$$

$$R = 1 + \frac{BD * K_D}{T_{FC}} \tag{8}$$

$$K_D = K_{OC} * OC \tag{9}$$

where:
- $dd_s$ = Change in depth of the solute
- $q$ = Amount of water passing the depth $d_s$
- $d_s$ = Depth of the solute front in a uniform soil
- $R$ = Retardation factor
- $T_{FC}$ = Soil-water content on a volume basis at field capacity
- $BD$ = Soil Bulk Density
- $K_D$ = Partition coefficient of the chemical in soil
- $K_{OC}$ = Organic carbon partition coefficient
- $OC$ = Organic carbon content of the soil

Chemicals are exposed to degradation processes. The model predicts the fraction F of the applied chemical remaining in the entire soil profile as:

$$F = \exp\left(-t * \frac{\ln(2)}{t_{1/2}}\right) \qquad (10)$$

where: $t$ = Elapsed time since the chemical was applied

$t_{1/2}$ = Biological degradation half-life of the chemical

Pesticide movement predictions given by the CMLS model are based on the following assumptions (Nofziger and Hornsby, 1986):

1. All soil water residing in pore spaces participates in the transportation process. If this assumption is not valid and a portion of the soil water is bypassed during flow, the model underestimates the depth of the chemical front;
2. Water entering the soil redistributes instantaneously to field capacity;
3. Root distribution is uniform with depth;
4. Upward movement of soil-water does not occur;
5. The adsorption process can be described by a linear, reversible equilibrium model; and
6. The half-life time for biological degradation is constant with time and soil depth.

Further explanations of these concepts and the user interaction of the CMLS model are given by Nofziger and Hornsby (1986 and 1988).

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Example Of Chemical Movement In Layered Soil Model
CMLS Model Application

Model Inputs:

Pesticide.....

Organic Carbon Partition Coef..... Half Life.....

Application Depth..... Application Date.....

Quantity..... Crop Variety.....

Rooting Depth..... Soil Texture.....

Soil Name..... Soil Identifier.....

Rain Fall Data File..... Evapo. Data File.....

Model Output:

Time (days) to reach 1 m. depth.....
Relative Amount Remaining.....

Time (days) to reach 1.5 m. depth.....
Relative Amount Remaining.....

Time (days) to reach 2 m. depth.....
Relative Amount Remaining.....

Time (days) to reach 3 m. depth.....
Relative Amount Remaining.....

** Use F1 (Function Key for Help)**

TABLE 17. Pesticide Data

| Pesticide Library Cont. | | Use | Health Advisory(ppb) |
|---|---|---|---|
| Common Name | :ALACHLOR | H | 1.5 |
| Partition Coefficient | :190 mg/g OC | | |
| Half-Life | :14 days | | |
| Trade Name | :ALANEX | | |
| Trade Name | :PILLARZO | | |
| Trade Name | :LASSO | | |
| Trade Name | :. | | |

TABLE 18. Example of Soil Data

Soil Name : HILLFIELD Identifier : UT0394

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.08 | 2.48 | 1.44 | 23.0 | 11.0 | 41.2 |
| 2 | 0.25 | 1.77 | 1.44 | 23.0 | 11.0 | 41.2 |
| 3 | 0.46 | 1.03 | 1.45 | 22.0 | 10.0 | 41.2 |
| 4 | 0.79 | 0.65 | 1.35 | 25.0 | 12.0 | 41.2 |
| 5 | 1.27 | 0.20 | 1.45 | 18.0 | 8.0 | 41.2 |
| 6 | 1.63 | 0.10 | 1.45 | 18.0 | 8.0 | 41.2 |

TABLE 19. Rooting Depths

| Crop | Rooting Depth in Meters |
|---|---|
| Alfalfa | 1.50 |
| Corn | 0.90 |
| Small Grains | 1.10 |
| Onions | 0.30 |
| Potatoes | 0.80 |
| Vegetables | 0.60 |
| Trees | 1.20 |

TABLE 7.—*Physical and chemi*

| Soil | Depth from surface | Size class and diameter of particles | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Very coarse sand (2.0-1.0 mm.) | Coarse sand (1.0-0.5 mm.) | Medium sand (0.5-0.25 mm.) | Fine sand (0.25-0.10 mm.) | Very fine sand (0.1-0.05 mm.) | Silt (0.05-0.002 mm.) | Clay (less tha 0.002 mm.) |
| | Inches | Percent | Percent | Percent | Percent | Percent | Percent | Percent |
| Preston sand: | | | | | | | | |
| A11 | 0-7 | 1.9 | 13.4 | 18.2 | 45.2 | 13.7 | 3.2 | 4.4 |
| A12 | 7-19 | .8 | 14.9 | 22.3 | 38.2 | 10.4 | 6.6 | 6.8 |
| C1 | 19-30 | .7 | 14.7 | 27.2 | 37.1 | 7.8 | 5.7 | 6.8 |
| C2 | 30-80 | .6 | 17.7 | 41.4 | 32.3 | 3.5 | 2.3 | 2.2 |
| Taylorsville silty clay loam: | | | | | | | | |
| Ap | 0-7 | .4 | .6 | .8 | 2.6 | 8.2 | 54.7 | 32.7 |
| AC | 7-17 | .1 | .3 | .6 | 1.8 | 6.9 | 54.4 | 35.9 |
| C1ca | 17-27 | .1 | .1 | .2 | .8 | 4.2 | 61.1 | 33.5 |
| C2ca | 27-37 | .1 | .1 | .1 | .6 | 5.8 | 61.5 | 31.8 |
| C3 | 37-59 | 0 | .1 | .1 | .8 | 4.1 | 58.5 | 36.4 |
| IIC4 | 59-65 | .2 | 4.4 | 11.8 | 45.9 | 14.3 | 15.1 | 8.3 |
| Terminal silt loam: | | | | | | | | |
| A21 | 0-5 | .5 | 1.7 | 3.7 | 13.9 | 14.5 | 51.8 | 13.9 |
| A22 | 5-9 | .5 | 1.4 | 2.5 | 8.9 | 12.8 | 57.5 | 16.4 |
| B2t | 9-13 | 0 | .3 | .5 | 1.9 | 13.5 | 49.1 | 34.7 |
| B3ca | 13-14 | .4 | 5.9 | 6.6 | 7.4 | 13.3 | 38.4 | 28.0 |
| C1cam | 14-16 | --- | --- | --- | --- | --- | --- | --- |
| C2 | 16-29 | 0 | .2 | .6 | 3.0 | 7.9 | 57.0 | 31.3 |
| IIC3 | 29-39 | 2.8 | 11.0 | 19.6 | 50.3 | 9.2 | 2.8 | 4.3 |
| IIIC4 | 39-60 | .7 | 1.6 | 1.6 | 3.1 | 5.1 | 51.1 | 36.8 |
| Trenton silt loam: | | | | | | | | |
| Ap | 0-6 | .5 | .6 | .6 | 3.9 | 9.8 | 60.1 | 24.5 |
| B21t | 6-12 | .2 | .2 | .3 | 1.2 | 3.3 | 58.7 | 36.1 |
| B22tca | 12-16 | .5 | .4 | .1 | 1.9 | 4.4 | 57.7 | 35.0 |
| B3ca | 16-30 | .3 | .4 | .4 | 1.8 | 4.9 | 60.0 | 32.2 |
| C1ca | 30-36 | 1.2 | 1.6 | 1.7 | 5.3 | 7.9 | 53.4 | 28.9 |
| IIC2ca | 36-45 | 3.5 | 4.2 | 3.8 | 15.0 | 14.4 | 36.1 | 23.0 |
| IIC3ca | 45-64 | 7.5 | 7.4 | 7.4 | 25.1 | 17.4 | 24.5 | 10.7 |
| Wasatch loamy coarse sand: | | | | | | | | |
| A11 | 0-2 | 6.5 | 29.3 | 21.7 | 21.4 | 7.7 | 9.8 | 3.6 |
| A12 | 2-11 | 5.6 | 25.6 | 22.6 | 23.6 | 7.4 | 10.8 | 4.4 |
| AC | 11-21 | 5.4 | 25.6 | 22.7 | 24.7 | 7.1 | 9.7 | 4.8 |
| C1 | 21-32 | 6.2 | 27.9 | 22.4 | 23.6 | 6.5 | 8.2 | 5.2 |
| C2 | 32-50 | 4.6 | 28.7 | 23.2 | 25.7 | 6.4 | 5.8 | 5.6 |
| Welby silt loam: | | | | | | | | |
| Ap | 0-8 | .3 | .6 | .8 | 6.8 | 22.9 | 51.3 | 17.3 |
| A3 | 8-16 | .1 | .2 | .3 | 6.0 | 25.6 | 52.0 | 15.8 |
| B2 | 16-25 | .1 | .2 | .2 | 6.5 | 25.7 | 49.6 | 17.7 |
| C1ca | 25-33 | .2 | .5 | .7 | 11.0 | 30.6 | 39.0 | 18.0 |
| C2 | 33-44 | .1 | .3 | .4 | 7.0 | 25.6 | 53.8 | 12.8 |
| C3 | 44-50 | 0 | .1 | .1 | 1.2 | 9.9 | 59.7 | 29.0 |

1/ Based on fraction less than three-fourths inch in size. Coarse fragments larger than three-fourths inch were discarded from sample.

2/ Data from SCS Soil Survey Laboratory, Riverside, Calif.

*properties of selected soils*—Continued

| Coarse fragments1/ (> 2.0 mm.) (Estimated) | Reaction (1:5 dilution) | Organic matter | Soluble salts (Bureau cup) | Electrical conductivity | Calcium carbonate equivalent | Cation-exchange capacity | Exchangeable sodium |
|---|---|---|---|---|---|---|---|
| Percent | pH | Percent | Percent | Mmhos. per cm. at 25° C. | Percent | Meq. per 100 gm. of soil | Percent |
| --- | 6.7 | .89 | <.03 | .31 | --- | 3.70 | 2 |
| --- | 6.8 | .89 | <.03 | .29 | --- | 5.90 | 2 |
| --- | 7.5 | .52 | <.03 | .35 | --- | 4.90 | 1 |
| --- | 7.2 | .12 | <.03 | .23 | --- | 1.60 | 4 |
| --- | 7.6 | 3.37 | .08 | 5.3 | 4.6 | 25.70 | 3 |
| --- | 7.5 | .98 | .08 | 2.1 | 13.0 | 20.80 | 4 |
| --- | 7.6 | .60 | .09 | 1.9 | 31.8 | 14.20 | 6 |
| --- | 7.7 | .58 | .09 | 1.9 | 27.4 | 15.70 | 5 |
| --- | 7.7 | .64 | .08 | 1.5 | 19.4 | 15.50 | 5 |
| --- | 7.9 | .17 | .03 | 1.7 | 9.9 | 4.30 | 2 |
| --- | 7.6 | 1.63 | .05 | 1.74 | --- | 15.20 | 3 |
| --- | 7.7 | .79 | .02 | 5.87 | --- | 15.30 | 1 |
| --- | 8.5 | 1.20 | 1.20 | 26.12 | 17.6 | 22.80 | 33 |
| --- | 8.6 | .86 | .45 | 15.83 | 38.1 | 20.00 | 20 |
| --- | --- | --- | --- | --- | --- | --- | --- |
| --- | 9.0 | .33 | .65 | 10.47 | 21.4 | 18.70 | 29 |
| --- | 8.8 | .09 | .07 | 8.34 | 5.4 | 3.10 | 29 |
| --- | 8.5 | .45 | 2.00 | 26.69 | 29.9 | 23.00 | 15 |
| --- | 7.4 | 1.99 | .09 | 1.82 | --- | 23.60 | 2 |
| --- | 7.6 | 1.39 | .09 | .91 | 1.0 | 33.90 | 7 |
| --- | 8.3 | 1.30 | .10 | 1.04 | 7.7 | 31.60 | 12 |
| --- | 8.6 | .91 | .15 | 2.30 | 7.0 | 28.20 | 32 |
| --- | 8.6 | .98 | .20 | 3.44 | 4.0 | 25.50 | 43 |
| 25 | 8.6 | .70 | .15 | 3.01 | 3.2 | 17.40 | 45 |
| 70 | 9.1 | .44 | .06 | 1.93 | 1.2 | 9.00 | 50 |
| --- | 6.1 | 1.63 | <.02 | .75 | --- | 5.22 | --- |
| --- | 6.5 | .63 | <.02 | .50 | --- | 5.02 | --- |
| --- | 7.0 | .38 | <.02 | .47 | --- | 5.03 | --- |
| 15 | 7.2 | --- | <.02 | .41 | --- | 5.03 | --- |
| --- | 7.4 | --- | <.02 | .41 | --- | 2.76 | --- |
| --- | 7.7 | 2.37 | .05 | 3.39 | 4.9 | 16.60 | 4 |
| --- | 7.9 | 1.12 | .05 | 1.82 | 5.8 | 13.70 | 7 |
| --- | 7.5 | .65 | .15 | 4.47 | 13.7 | 10.20 | 10 |
| --- | 7.6 | .43 | .15 | 4.92 | 21.0 | 6.80 | 11 |
| --- | 7.8 | .38 | .20 | 5.17 | 21.4 | 9.80 | 11 |
| --- | 7.6 | .30 | .35 | 6.55 | 16.9 | 17.10 | 9 |

* O. Carbon = O. matter / 1.724

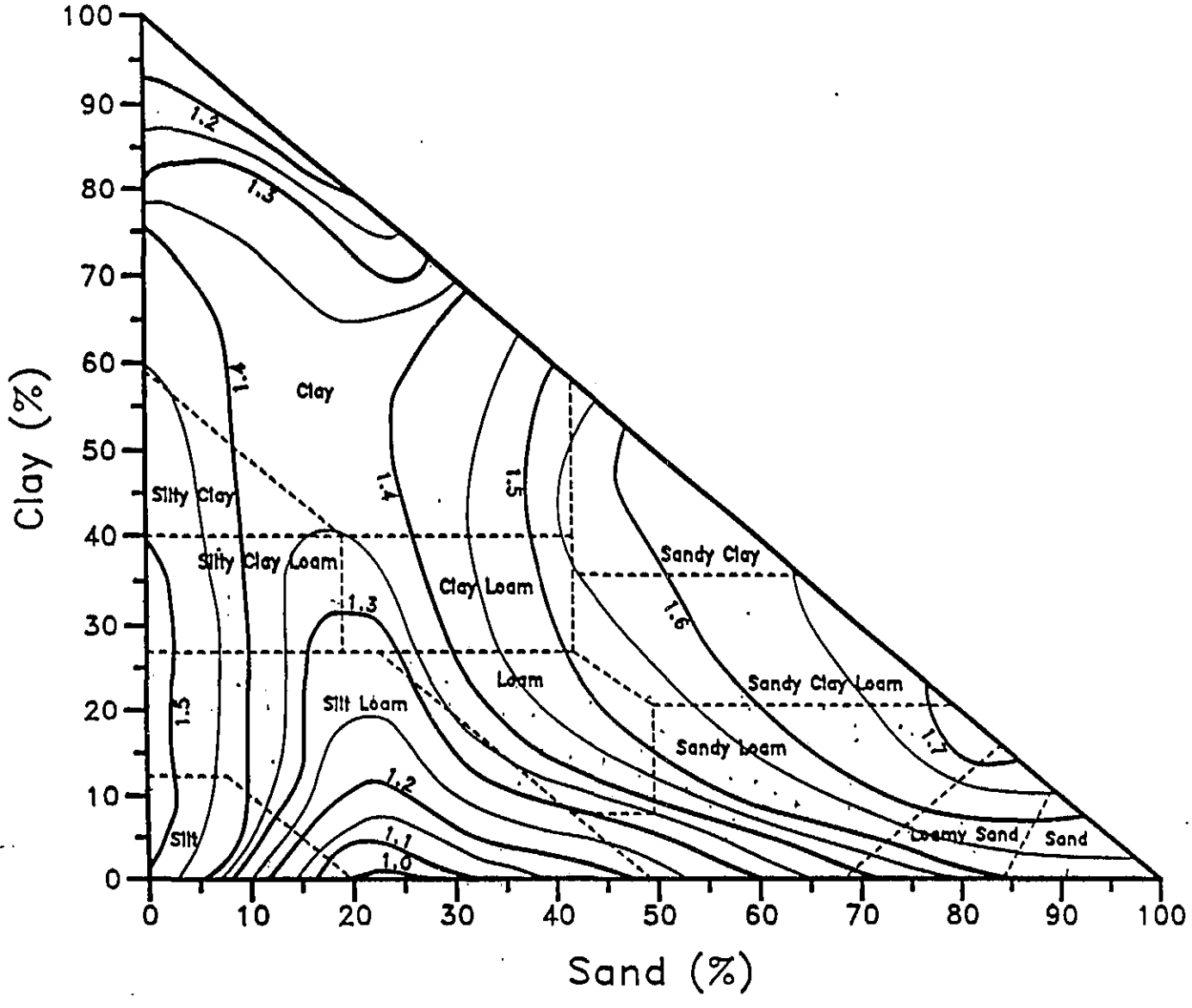


Figure 12. Mineral bulk density (g $cm^{-3}$). (Provided by Dr. Walter J. Rawls, U.S. Department of Agriculture, Agricultural Research Service, Beltsville, Maryland.)

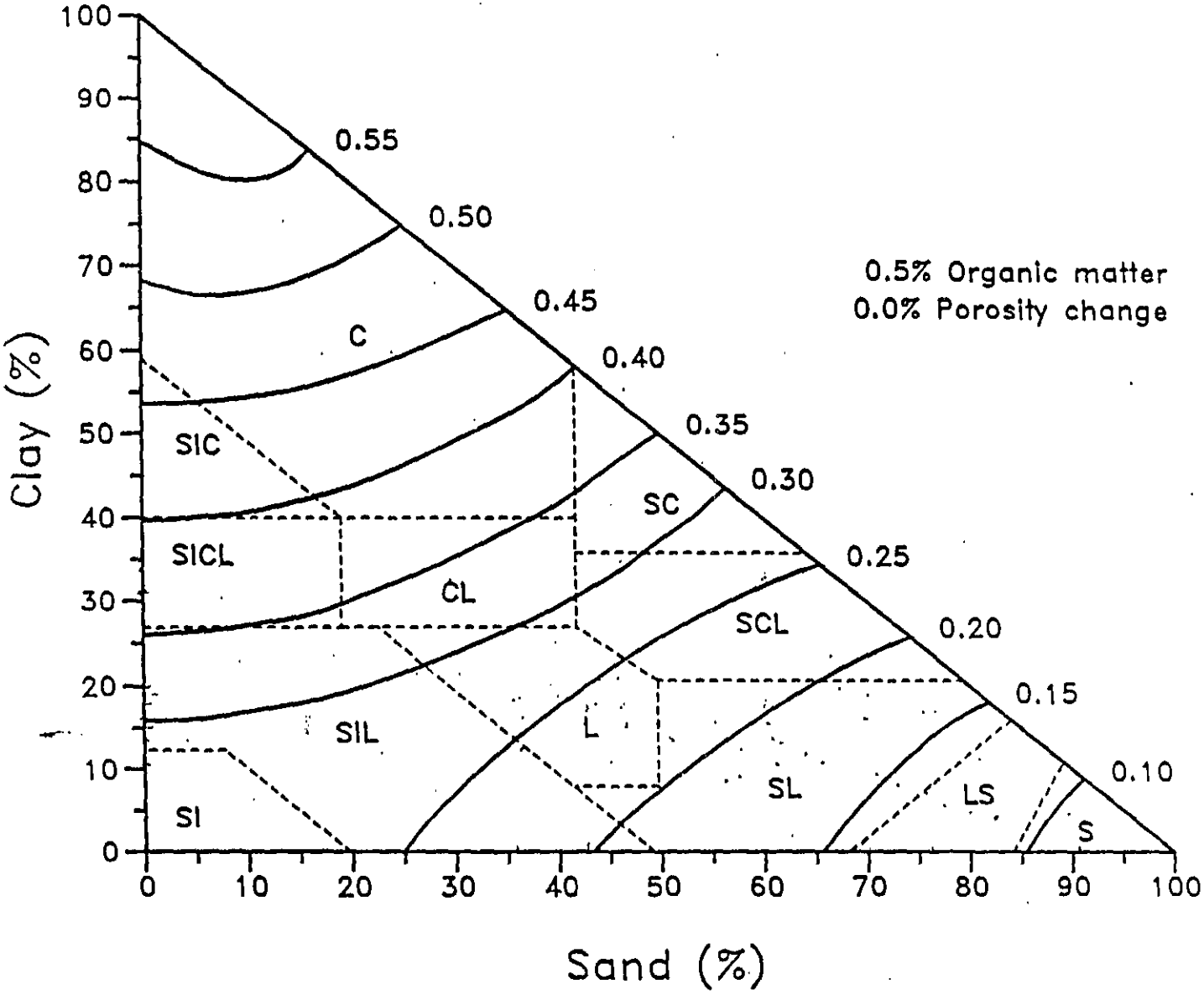


Figure 10. 1/3-Bar soil moisture by volume. (Provided by Dr. Walter J. Rawls, U.S. Department of Agriculture, Agricultural Research Service.

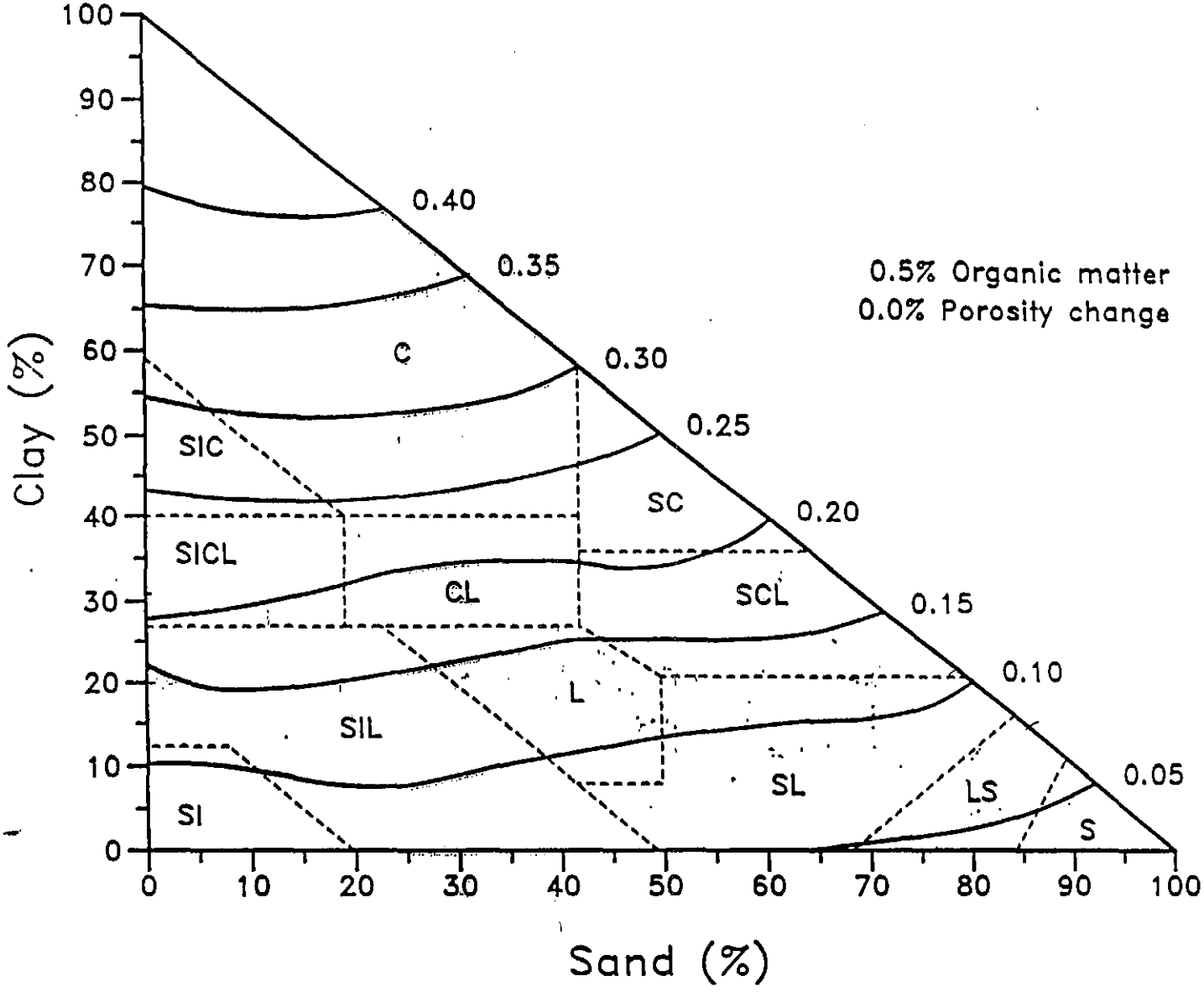


Figure 11. 15-Bar soil moisture by volume. (Provided by Dr. Walter J. Rawls, U.S. Department of Agriculture, Agricultural Research Service, Beltsville, Maryland.)

Table 21. Hydrologic Properties by Soil Texture[a]

| Texture Class | Residual Porosity ($\theta_r$) $cm^3\ cm^{-3}$ | Effective Porosity ($\theta_e$) $cm^3\ cm^{-3}$ |
|---|---|---|
| Sand | 0.020[b] (0.001-0.039)[c] | 0.417 (0.354-0.480) |
| Loamy Sand | 0.035 (0.003-0.067) | 0.401 (0.329-0.473) |
| Sandy Loam | 0.041 (0.0-0.106) | 0.412 (0.283-0.541) |
| Loam | 0.027 (0.0-0.074) | 0.434 (0.334-0.534) |
| Silt Loam | 0.015 (0.0-0.058) | 0.486 (0.394-0.578) |
| Sandy Clay Loam | 0.068 (0.0-0.237) | 0.330 (0.235-0.425) |
| Clay Loam | 0.075 (0.0-0.174) | 0.390 (0.279-0.501) |
| Silty Clay Loam | 0.040 (0.0-0.118) | 0.432 (0.347-0.517) |
| Sandy Clay | 0.109 (0.0-0.205) | 0.321 (0.207-0.435) |
| Silty Clay | 0.056 (0.0-0.136) | 0.423 (0.334-0.512) |
| Clay | 0.090 (0.0-0.195) | 0.385 (0.269-0.501) |

[a]Rawls, W.J., D.L. Brakensiek, and K.E. Saxton. Estimation of Soil Water Properties. Transactions ASAE Paper No. 81-2510, pgs. 1316 - 1320. 1982.

[b]Mean value.

[c]One standard deviation about the mean.

Method 2

Step 1. Use Table 20 to locate the textural classification of the soil.

Step 2. Read mean bulk density for the general soil texture.

Step 3. Example: Sandy loam. The mean bulk density is 1.49 g $cm^{-3}$.

Table 20. Mean Bulk Density (g $cm^{-3}$) for Five Soil Textural Classifications[a]

| Soil Texture | Mean Value | Range Reported |
|---|---|---|
| Silt Loams | 1.32 | 0.86 - 1.67 |
| Clay and Clay Loams | 1.30 | 0.94 - 1.54 |
| Sandy Loams | 1.49 | 1.25 - 1.76 |
| Gravelly Silt Loams | 1.22 | 1.02 - 1.58 |
| Loams | 1.42 | 1.16 - 1.58 |
| All Soils | 1.35 | 0.86 - 1.76 |

[a]Baes, C. F., III and R. D. Sharp. 1983. A Proposal for Estimation of Soil Leaching Constants for Use in Assessment Models. J. Environ. Qual. 12(1): 17-28.

Table 19. Hydrologic Properties by Soil Texture[a]

| Texture Class | Range of Textural Properties (Percent) Sand | Silt | Clay | Water Retained at -0.33 Bar Tension $cm^3\ cm^{-3}$ | Water Retained at -15.0 Bar Tension $cm^3\ cm^{-3}$ |
|---|---|---|---|---|---|
| Sand | 85-100 | 0-15 | 0-10 | 0.091[b] (0.018 - 0.164)[c] | 0.033[b] (0.007 - 0.059)[c] |
| Loamy Sand | 70-90 | 0-30 | 0-15 | 0.125 (0.060 - 0.190) | 0.055 (0.019 - 0.091) |
| Sandy Loam | 45-85 | 0-50 | 0-20 | 0.207 (0.126 - 0.288) | 0.095 (0.031 - 0.159) |
| Loam | 25-50 | 28-50 | 8-28 | 0.270 (0.195 - 0.345) | 0.117 (0.069 - 0.165) |
| Silt Loam | 0-50 | 50-100 | 0-28 | 0.330 (0.258 - 0.402) | 0.133 (0.078 - 0.188) |
| Sandy Clay Loam | 45-80 | 0-28 | 20-35 | 0.257 (0.186 - 0.324) | 0.148 (0.085 - 0.211) |
| Clay Loam | 20-45 | 15-55 | 28-50 | 0.318 (0.250 - 0.386) | 0.197 (0.115 - 0.279) |
| Silty Clay Loam | 0-20 | 40-73 | 28-40 | 0.366 (0.304 - 0.428) | 0.208 (0.138 - 0.278) |
| Sandy Clay | 45-65 | 0-20 | 35-55 | 0.339 (0.245 - 0.433) | 0.239 (0.162 - 0.316) |
| Silty Clay | 0-20 | 40-60 | 40-60 | 0.387 (0.332 - 0.442) | 0.250 (0.193 - 0.307) |
| Clay | 0-45 | 0-40 | 40-100 | 0.396 (0.326 - 0.466) | 0.272 (0.208 - 0.336) |

[a]Rawls, W.J., D.L. Brakensiek, and K.E. Saxton. Estimation of Soil Water Properties. Transactions ASAE Paper No. 81-2510, pgs. 1316 - 1320. 1982.

[b]Mean value.

[c]One standard deviation about the mean.

County: Washington (1 of 1)

| Crop/Year | Pesticide/Type | Lbs a.i. or a.e./Acre | Applied Mnth/Wk | Formulation |
|---|---|---|---|---|
| Alfalfa/1 | None | | | |
| Alfalfa/2-4 (About 20-25% treated with Hexazinone and less than 5% with Metribuzin) | Hexazinone/H | 1.0-2.0 | February/4 | L |
| | or | | | |
| | Metribuzin/H | 0.4-1.0 | February/4 | F |
| | and | | | |
| | Chlorpyrifos/I | 0.25 | April/1 | E |
| | or | | | |
| | Parathion/I | 0.50 | April/1 | E |
| Small Grains/5-6 | None | | | |
| Field Corn or Sorghum/7 | None | | | |
| Peaches | Azinphos-Methyl/I | 2.0-4.0 | May/3 and June/1 2 applications | WP |

H = Herbicide
I = Insecticide

a.i. = active ingredient
a.e. = acid equivalent

E = Emulsifiable Concentrate
F = Flowable
L = Liquid
WP = Wettable Powder

CMLS-Analysis: Washington County (1/1)

| Crop | Pesticide (Common/Trade) | Quantity (kg/ha) | Depth (m) | Time (days) | Rel. Amount | Concent. (ppb) | Health Advise(ppb) | Ratio |
|---|---|---|---|---|---|---|---|---|
| Alfalfa | Hexazinone | 1.5 | 1.0 | 100 | 0.315 | 472.5 | 210 | 2.25 |
| | | | 1.5 | 117 | 0.258 | 338.2 | | 1.849 |
| | | | 2.0 | 117 | 0.258 | 338.2 | | 1.849 |
| | | | 3.0 | 147 | 0.183 | 274.5 | | 1.307 |
| | Metribuzin | 1.0 | 1.0 | 117 | 0.067 | 67 | 175 | 0.3829 |
| | | | 1.5 | 117 | 0.067 | 67 | | 0.3829 |
| | | | 2.0 | 131 | 0.0485 | 48.5 | | 0.2771 |
| | | | 3.0 | 161 | 0.0242 | 24.2 | | 0.1383 |
| | Chlorpyrifos | 0.25 | 1.0 | 1735 | | | | |
| | | | 1.5 | 1735 | | | | |
| | | | 2.0 | 1735 | | | | |
| | | | 3.0 | 1735 | | | | |
| | Parathion | 0.5 | 1.0 | 487 | 3.4E-11 | 1.7E-8 | | |
| | | | 1.5 | 821 | 2.2E-18 | 1.1E-15 | | |
| | | | 2.0 | 1171 | 6.6E-26 | 3.3E-23 | | |
| | | | 3.0 | 1735 | | | | |
| Orchards | | | | | | | | |
| | Aziaphos-Methyl | 3.0 | 1.0 | 778 | 1.4E-6 | 4.2E-3 | | |
| | | | 1.2 | 1093 | 5.9E-9 | 1.77E-5 | | |
| | | | 2.0 | 1560 | 1.8E-12 | 5.4E-9 | | |
| | | | 3.0 | 2068 | | | | |

TABLE 27. Ranking of Pesticide-Site Combinations Posing a Threat to Groundwater Quality

| Rank | Pesticide | Site/County | Rank | Pesticide | Site/County |
|---|---|---|---|---|---|
| 1 | Metolachlor | 6/Weber | 18 | Carbofuran | 18/Juab |
| 2 | Aldicarb | 8/Davis | 19 | Hexazinone | 16/Uintah |
| 3 | Carbofuran | 23/Sevier | 20 | Carbofuran | 1/Cache |
| 4 | Dicamba | 23/Sevier | 21 | Hexazinone | 6/Weber |
| 5 | Atrazine | 1/Cache | 22 | 2,4-D Acid | 6/Weber |
| 6 | Atrazine | 23/Sevier | 23 | Dicamba | 19/Sanpte |
| 7 | Carbofuran | 28/Sanpete | 24 | 2,4-D Ester | 19/Sanpete |
| 8 | Carbofuran | 6/Weber | 25 | Dicamba | 15/Duchesne |
| 9 | Carbofuran | 25/Beaver | 26 | Hexazinone | 23/Sevier |
| 10 | Dicamba | 1/Cache | 27 | 2,4-D Acid | 1/Cache |
| 11 | Atrazine | 28/Sanpete | 28 | Hexazinone | 21/Millard |
| 12 | Barban | 23/Sevier | 29 | Hexazinone | 25/Beaver |
| 13 | Bentazone | 8/Davis | 30 | Chlorsulfuron | 1/Cache |
| 14 | Atrazine | 16/Uintah | 31 | Aldicarb | 29/Iron |
| 15 | Hexazinone | 9/Morgan | 32 | 2,4-DB Amine | 21/Millard |
| 16 | Hexazinone | 24/Grand | 33 | Oxydemeton-Methyl | 21/Millard |
| 17 | Dicamba | 9/Morgan | | | |

## Soil Library Used in Utah

## Soil Library Used in Utah

Soil Name : ABRAHAM  Identifier : UT0132

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.20 | 0.10 | 1.45 | 25.0 | 13.0 | 43.0 |
| 2 | 0.84 | 0.20 | 1.45 | 25.0 | 13.0 | 43.0 |
| 3 | 1.35 | 0.10 | 1.45 | 25.0 | 13.0 | 43.0 |
| 4 | 1.60 | 0.10 | 1.45 | 25.0 | 13.0 | 43.0 |

Soil Name : DUCHESNE  Identifier : DU1

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.15 | 5.00 | 1.45 | 17.0 | 8.0 | 40.0 |
| 2 | 0.30 | 1.00 | 1.50 | 17.0 | 8.0 | 40.0 |
| 3 | 0.40 | 0.50 | 1.50 | 17.0 | 8.0 | 40.0 |
| 4 | 0.50 | 0.20 | 1.50 | 17.0 | 8.0 | 40.0 |
| 5 | 0.60 | 0.10 | 1.50 | 17.0 | 8.0 | 40.0 |

Soil Name : GENOLA  Identifier : UT1475

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.18 | 0.80 | 1.35 | 19.0 | 10.5 | 43.0 |
| 2 | 0.33 | 1.86 | 1.35 | 19.4 | 11.3 | 43.0 |
| 3 | 0.48 | 0.35 | 1.35 | 20.8 | 7.4 | 43.0 |
| 4 | 0.58 | 0.29 | 1.35 | 22.7 | 7.6 | 43.0 |
| 5 | 0.79 | 0.23 | 1.40 | 19.5 | 13.1 | 43.0 |
| 6 | 0.86 | 0.23 | 1.35 | 21.9 | 9.0 | 43.0 |
| 7 | 0.94 | 0.30 | 1.40 | 15.2 | 10.3 | 43.0 |
| 8 | 1.02 | 0.17 | 1.40 | 17.4 | 5.0 | 43.0 |
| 9 | 1.07 | 0.23 | 1.35 | 19.5 | 11.3 | 43.0 |
| 10 | 1.17 | 0.10 | 1.35 | 19.5 | 11.3 | 43.0 |

Soil Name : GRAND  Identifier : GRN1

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.15 | 1.20 | 1.45 | 22.0 | 8.0 | 40.0 |
| 2 | 0.30 | 1.00 | 1.45 | 22.0 | 8.0 | 40.0 |
| 3 | 0.40 | 0.50 | 1.45 | 22.0 | 8.0 | 40.0 |
| 4 | 0.50 | 0.20 | 1.45 | 22.0 | 8.0 | 40.0 |
| 5 | 0.60 | 0.10 | 1.45 | 22.0 | 8.0 | 40.0 |

Soil Name : HARRISBURG  Identifier : UTU003

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.05 | 0.22 | 1.70 | 13.0 | 5.5 | 40.0 |
| 2 | 0.41 | 0.14 | 1.66 | 13.5 | 6.0 | 40.0 |
| 3 | 0.66 | 0.09 | 1.69 | 13.5 | 6.0 | 40.0 |
| 4 | 0.89 | 0.21 | 1.59 | 13.5 | 6.5 | 40.0 |
| 5 | 0.99 | 0.10 | 1.59 | 13.5 | 6.5 | 40.0 |

Soil Name : HILLFIELD  Identifier : UT0394

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.08 | 2.48 | 1.44 | 23.0 | 11.0 | 41.2 |
| 2 | 0.25 | 1.77 | 1.44 | 23.0 | 11.0 | 41.2 |
| 3 | 0.46 | 1.03 | 1.45 | 22.0 | 10.0 | 41.2 |
| 4 | 0.79 | 0.65 | 1.35 | 25.0 | 12.0 | 41.2 |
| 5 | 1.27 | 0.20 | 1.45 | 18.0 | 8.0 | 41.2 |
| 6 | 1.63 | 0.10 | 1.45 | 18.0 | 8.0 | 41.2 |

Soil Name : JUAB  Identifier : UT0699

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.10 | 1.69 | 1.40 | 24.0 | 8.1 | 43.0 |
| 2 | 0.20 | 0.81 | 1.40 | 26.0 | 10.0 | 43.0 |
| 3 | 0.33 | 0.89 | 1.40 | 27.0 | 9.9 | 43.0 |
| 4 | 0.53 | 0.36 | 1.40 | 25.0 | 8.6 | 43.0 |
| 5 | 0.74 | 0.49 | 1.50 | 23.0 | 7.8 | 43.0 |
| 6 | 0.97 | 0.34 | 1.45 | 24.0 | 8.0 | 43.0 |
| 7 | 1.52 | 0.30 | 1.26 | 30.0 | 12.0 | 43.0 |
| 8 | 1.62 | 0.10 | 1.26 | 30.0 | 12.0 | 43.0 |

Soil Name : KANE  Identifier : KA1

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.15 | 1.00 | 1.50 | 18.0 | 8.0 | 40.0 |
| 2 | 0.30 | 0.50 | 1.50 | 18.0 | 8.0 | 40.0 |
| 3 | 0.60 | 0.30 | 1.50 | 18.0 | 8.0 | 40.0 |
| 4 | 0.90 | 0.20 | 1.50 | 18.0 | 8.0 | 40.0 |
| 5 | 1.00 | 0.10 | 1.50 | 18.0 | 8.0 | 40.0 |

Soil Name : IRON  Identifier : IR1

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.10 | 1.69 | 1.40 | 24.0 | 8.1 | 43.0 |
| 2 | 0.20 | 0.81 | 1.40 | 26.0 | 10.0 | 43.0 |
| 3 | 0.33 | 0.89 | 1.40 | 27.0 | 9.9 | 43.0 |
| 4 | 0.53 | 0.36 | 1.40 | 25.0 | 8.6 | 43.0 |
| 5 | 0.74 | 0.49 | 1.50 | 23.0 | 7.8 | 43.0 |
| 6 | 0.97 | 0.34 | 1.45 | 24.0 | 8.0 | 43.0 |
| 7 | 1.52 | 0.30 | 1.26 | 30.0 | 12.0 | 43.0 |
| 8 | 1.62 | 0.10 | 1.26 | 30.0 | 12.0 | 43.0 |

Soil Name : KIDMAN  Identifier : UT0395

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.28 | 1.20 | 1.52 | 18.0 | 6.4 | 40.0 |
| 2 | 0.43 | 0.70 | 1.52 | 18.5 | 6.4 | 40.0 |
| 3 | 0.53 | 0.80 | 1.53 | 20.0 | 6.9 | 40.0 |
| 4 | 0.69 | 0.40 | 1.54 | 22.0 | 7.0 | 40.0 |
| 5 | 0.94 | 0.20 | 1.40 | 21.5 | 5.3 | 40.0 |
| 6 | 1.24 | 0.20 | 1.45 | 21.5 | 5.7 | 40.0 |
| 7 | 1.47 | 0.10 | 1.42 | 18.0 | 4.4 | 40.0 |

Soil Name : KOVICH  Identifier : UT0306

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.03 | 11.00 | 1.50 | 25.0 | 13.0 | 43.0 |
| 2 | 0.28 | 2.60 | 1.50 | 23.0 | 13.0 | 43.0 |
| 3 | 0.61 | 1.30 | 1.50 | 26.0 | 15.0 | 43.0 |
| 4 | 0.74 | 0.60 | 1.55 | 23.0 | 14.0 | 43.0 |
| 5 | 1.04 | 0.70 | 1.60 | 22.0 | 13.0 | 43.0 |
| 6 | 1.14 | 0.10 | 1.60 | 22.0 | 13.0 | 43.0 |

Soil Name : LASIL  Identifier : UT0583

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.15 | 2.10 | 1.42 | 33.0 | 13.0 | 50.0 |
| 2 | 0.23 | 1.50 | 1.44 | 33.0 | 14.3 | 50.0 |
| 3 | 0.33 | 0.80 | 1.44 | 36.0 | 14.7 | 50.0 |
| 4 | 0.48 | 0.50 | 1.40 | 38.0 | 20.4 | 50.0 |
| 5 | 0.58 | 0.50 | 1.42 | 37.0 | 18.0 | 50.0 |
| 6 | 0.91 | 0.40 | 1.42 | 40.0 | 18.0 | 50.0 |
| 7 | 1.12 | 0.40 | 1.43 | 37.0 | 16.5 | 50.0 |
| 8 | 1.52 | 0.40 | 1.45 | 38.0 | 16.8 | 50.0 |

Soil Name : LAYTON  Identifier : UT0338

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.18 | 0.70 | 1.55 | 12.5 | 3.7 | 40.0 |
| 2 | 0.38 | 0.50 | 1.55 | 13.0 | 4.0 | 40.0 |
| 3 | 0.58 | 0.20 | 1.55 | 14.0 | 4.5 | 40.0 |
| 4 | 0.74 | 0.20 | 1.55 | 12.5 | 4.0 | 40.0 |
| 5 | 1.04 | 0.10 | 1.54 | 12.0 | 3.3 | 40.0 |
| 6 | 1.68 | 0.10 | 1.52 | 8.0 | 1.7 | 42.0 |

Soil Name : LEWISTON  Identifier : UT0546

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.25 | 0.60 | 1.55 | 14.0 | 7.0 | 41.0 |
| 2 | 0.33 | 0.42 | 1.66 | 16.0 | 11.0 | 41.0 |
| 3 | 0.56 | 0.39 | 1.59 | 22.0 | 14.0 | 41.0 |
| 4 | 0.81 | 0.16 | 1.64 | 18.0 | 12.0 | 41.0 |
| 5 | 1.52 | 0.08 | 1.58 | 12.0 | 6.0 | 41.0 |

Soil Name : MANDERFIELD  Identifier : UTU001

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.13 | 1.62 | 1.45 | 22.6 | 16.3 | 43.0 |
| 2 | 0.41 | 0.64 | 1.40 | 20.5 | 11.1 | 43.0 |
| 3 | 0.61 | 0.60 | 1.45 | 20.8 | 10.1 | 43.0 |
| 4 | 0.84 | 0.29 | 1.45 | 22.0 | 10.0 | 43.0 |
| 5 | 1.17 | 0.26 | 1.45 | 19.0 | 10.0 | 43.0 |
| 6 | 1.52 | 0.20 | 1.45 | 18.7 | 5.5 | 43.0 |
| 7 | 1.62 | 0.10 | 1.45 | 18.7 | 5.5 | 43.0 |

Soil Name : MARTINI  Identifier : UT0404

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.13 | 1.80 | 1.28 | 18.0 | 9.0 | 40.0 |
| 2 | 0.38 | 0.60 | 1.46 | 14.5 | 8.0 | 40.5 |
| 3 | 0.48 | 0.10 | 1.55 | 9.0 | 4.5 | 40.0 |
| 4 | 1.14 | 0.60 | 1.44 | 17.0 | 9.0 | 40.0 |
| 5 | 1.78 | 0.50 | 1.52 | 14.0 | 8.0 | 40.0 |
| 6 | 1.88 | 0.10 | 1.52 | 14.0 | 8.0 | 40.0 |

Soil Name : MONTICELLO  Identifier : UT0454

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.08 | 1.33 | 1.52 | 22.0 | 13.0 | 41.0 |
| 2 | 0.20 | 0.81 | 1.52 | 20.0 | 12.0 | 41.0 |
| 3 | 0.56 | 0.41 | 1.50 | 25.0 | 14.0 | 41.0 |
| 4 | 0.81 | 0.27 | 1.45 | 27.0 | 16.0 | 43.0 |
| 5 | 1.14 | 0.16 | 1.43 | 27.0 | 15.0 | 43.0 |
| 6 | 1.42 | 0.16 | 1.50 | 25.0 | 14.0 | 43.0 |
| 7 | 1.52 | 0.10 | 1.50 | 25.0 | 14.0 | 43.0 |

Soil Name : PENOYER  Identifier : UTU002

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.10 | 1.00 | 1.45 | 24.0 | 13.0 | 43.0 |
| 2 | 0.23 | 1.20 | 1.40 | 25.0 | 13.0 | 43.0 |
| 3 | 0.58 | 0.60 | 1.52 | 19.0 | 10.0 | 43.0 |
| 4 | 1.04 | 0.18 | 1.46 | 23.0 | 11.0 | 43.0 |
| 5 | 1.52 | 0.06 | 1.40 | 22.0 | 11.0 | 43.0 |

Soil Name : PHAGE  Identifier : PI1

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.05 | 1.08 | 1.50 | 15.0 | 8.0 | 40.0 |
| 2 | 0.23 | 1.42 | 1.50 | 18.0 | 10.0 | 40.0 |
| 3 | 1.02 | 0.91 | 1.50 | 27.0 | 12.0 | 40.0 |
| 4 | 1.42 | 0.10 | 1.50 | 19.0 | 8.0 | 40.0 |

Soil Name : RAVOLA  Identifier : UT0480

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.20 | 1.00 | 1.45 | 25.0 | 13.0 | 43.0 |
| 2 | 1.52 | 0.50 | 1.45 | 25.0 | 15.0 | 43.0 |
| 3 | 1.62 | 0.10 | 1.45 | 25.0 | 15.0 | 43.0 |

Soil Name : SALERATUS  Identifier : UT0709

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.15 | 1.00 | 1.40 | 25.0 | 15.0 | 45.0 |
| 2 | 1.14 | 0.50 | 1.30 | 35.0 | 20.0 | 45.0 |
| 3 | 1.52 | 0.20 | 1.30 | 30.0 | 15.0 | 45.0 |
| 4 | 1.62 | 0.10 | 1.30 | 30.0 | 15.0 | 45.0 |

Soil Name : SEVIER  Identifier : SE1

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.15 | 1.00 | 1.35 | 20.0 | 10.0 | 43.0 |
| 2 | 0.30 | 0.70 | 1.35 | 20.0 | 10.0 | 43.0 |
| 3 | 0.60 | 0.30 | 1.35 | 20.0 | 8.0 | 43.0 |
| 4 | 0.90 | 0.20 | 1.35 | 20.0 | 10.0 | 43.0 |
| 5 | 1.00 | 0.10 | 1.35 | 20.0 | 10.0 | 43.0 |

Soil Name : SUMMIT  Identifier : UTE1229

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.15 | 1.00 | 1.40 | 25.0 | 12.0 | 43.0 |
| 2 | 0.30 | 0.70 | 1.40 | 25.0 | 12.0 | 43.0 |
| 3 | 0.60 | 0.30 | 1.40 | 25.0 | 12.0 | 43.0 |
| 4 | 0.90 | 0.20 | 1.40 | 25.0 | 12.0 | 43.0 |
| 5 | 1.00 | 0.10 | 1.40 | 25.0 | 12.0 | 43.0 |

Soil Name : SUNSET  Identifier : UT0076

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.43 | 1.20 | 1.40 | 27.0 | 14.0 | 43.0 |
| 2 | 1.14 | 0.70 | 1.30 | 23.0 | 10.0 | 49.0 |
| 3 | 1.60 | 0.10 | 1.55 | 10.0 | 5.0 | 40.0 |

Soil Name : TEBBS  Identifier : UTE1041

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.15 | 1.00 | 1.40 | 25.0 | 12.0 | 43.0 |
| 2 | 0.30 | 0.70 | 1.40 | 25.0 | 12.0 | 43.0 |
| 3 | 0.60 | 0.30 | 1.40 | 25.0 | 12.0 | 43.0 |
| 4 | 0.90 | 0.20 | 1.40 | 25.0 | 12.0 | 43.0 |
| 5 | 1.00 | 0.10 | 1.40 | 25.0 | 12.0 | 43.0 |

Soil Name : THATCHER  Identifier : UT0752

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.33 | 1.50 | 1.25 | 30.0 | 15.0 | 49.0 |
| 2 | 0.79 | 0.70 | 1.35 | 35.0 | 21.0 | 41.0 |
| 3 | 1.52 | 0.20 | 1.45 | 22.0 | 12.0 | 43.0 |
| 4 | 1.62 | 0.10 | 1.45 | 22.0 | 12.0 | 43.0 |

Soil Name : TOOELE  Identifier : TOOl

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.33 | 1.50 | 1.25 | 30.0 | 15.0 | 49.0 |
| 2 | 0.79 | 0.70 | 1.35 | 35.0 | 21.0 | 41.0 |
| 3 | 1.52 | 0.20 | 1.45 | 22.0 | 12.0 | 43.0 |
| 4 | 1.62 | 0.10 | 1.45 | 22.0 | 12.0 | 43.0 |

Soil Name : VINEYARD  Identifier : UT0350

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.18 | 0.81 | 1.70 | 16.0 | 8.0 | 40.0 |
| 2 | 0.33 | 0.47 | 1.70 | 16.0 | 8.0 | 40.0 |
| 3 | 0.61 | 0.31 | 1.70 | 17.0 | 9.0 | 40.0 |
| 4 | 0.89 | 0.21 | 1.70 | 18.0 | 9.0 | 40.0 |
| 5 | 1.07 | 0.21 | 1.70 | 19.0 | 10.0 | 40.0 |
| 6 | 1.52 | 0.12 | 1.70 | 16.0 | 8.0 | 40.0 |

Soil Name : UINTA  Identifier : UIl

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.08 | 5.00 | 1.35 | 28.0 | 15.0 | 43.0 |
| 2 | 0.28 | 1.00 | 1.55 | 15.0 | 8.0 | 40.0 |
| 3 | 1.07 | 0.30 | 1.63 | 25.0 | 17.0 | 35.0 |
| 4 | 1.17 | 0.10 | 1.63 | 25.0 | 17.0 | 35.0 |

Soil Name : WARMSPRINGS  Identifier : UT0415

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.20 | 0.80 | 1.62 | 17.0 | 10.0 | 40.0 |
| 2 | 0.38 | 0.30 | 1.62 | 19.0 | 12.0 | 40.0 |
| 3 | 0.61 | 0.10 | 1.64 | 18.0 | 13.0 | 40.0 |
| 4 | 0.94 | 0.10 | 1.68 | 16.0 | 10.0 | 40.0 |
| 5 | 1.52 | 0.10 | 1.65 | 13.0 | 7.0 | 40.0 |

Soil Name : WAYNE  Identifier : WAl

| Horizon | Depth (m) | Organic Carbon (%) | Bulk Density (Mg/cu meter) | Volumetric Water Content, (%) at -0.01 MPa | -1.5 MPa | Saturation |
|---|---|---|---|---|---|---|
| 1 | 0.15 | 1.00 | 1.35 | 20.0 | 10.0 | 43.0 |
| 2 | 0.30 | 0.70 | 1.35 | 20.0 | 10.0 | 43.0 |
| 3 | 0.60 | 0.30 | 1.35 | 20.0 | 8.0 | 43.0 |
| 5 | 1.00 | 0.10 | 1.35 | 20.0 | 10.0 | 43.0 |

## Library of Pesticides Used in Utah

## Library of Pesticide Used in Utah

| Pesticide Library | | Use[1] | Health Advisory(ppb) |
|---|---|---|---|
| Common Name | :2,4-D ACID | H | 70 |
| Partition Coefficient | :20 mg/g OC | | |
| Half-Life | :10 days | | |
| Trade Name | :DACAMINE | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :2,4-D ESTER | H | 70 |
| Partition Coefficient | :1000 mg/g OC | | |
| Half-Life | :10 days | | |
| Trade Name | :AQUA KLEEN | | |
| Trade Name | :WEEDONE | | |
| Trade Name | :EMULSAMINE | | |
| Trade Name | :. | | |
| Common Name | :2,4-D AMINE SALT | H | 70 |
| Partition Coefficient | :109 mg/g OC | | |
| Half-Life | :10 days | | |
| Trade Name | :WEEDAR | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :2,4-DB AMINE SALT | H | 70 |
| Partition Coefficient | :20 mg/g OC | | |
| Half-Life | :10 days | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :2,4-DB ESTER | H | 70 |
| Partition Coefficient | :1000 mg/g OC | | |
| Half-Life | :10 days | | |
| Trade Name | :BUTYRAC ESTER | | |
| Trade Name | :BUTOXONE | | |
| Trade Name | :. | | |
| Trade Name | :. | | |

[1] I-Insecticide; H-Herbicide; F-Fungicide; G-Growth Regulator; M-Miticide

| Pesticide Library Cont. | | Use | Health Advisory(ppb) |
|---|---|---|---|
| Common Name | :ALACHLOR | H | 1.5 |
| Partition Coefficient | :190 mg/g OC | | |
| Half-Life | :14 days | | |
| Trade Name | :LASSO | | |
| Trade Name | :PILLARZO | | |
| Trade Name | :ALANEX | | |
| Trade Name | :. | | |
| Common Name | :ALDICARB | I | 10 |
| Partition Coefficient | :30 mg/g OC | | |
| Half-Life | :30 days | | |
| Trade Name | :TEMIK | | |
| Trade Name | :TEMIK15G | | |
| Trade Name | :OMS 771 | | |
| Trade Name | :UC21149 | | |
| Common Name | :ATRAZINE | H | 3 |
| Partition Coefficient | :160 mg/g OC | | |
| Half-Life | :60 days | | |
| Trade Name | :AATREX | | |
| Trade Name | :GRIFFEX | | |
| Trade Name | :ATRANEX | | |
| Trade Name | :VECTAL SC | | |
| Common Name | :AZINPHOS-METHYL | I | |
| Partition Coefficient | :1000 mg/g OC | | |
| Half-Life | :40 days | | |
| Trade Name | :GUTHION | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :BARBAN | I | |
| Partition Coefficient | :30 mg/g OC | | |
| Half-Life | :30 days | | |
| Trade Name | :CARBYNE | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :BENOMYL | F | |
| Partition Coefficient | :2100 mg/g OC | | |
| Half-Life | :100 days | | |
| Trade Name | :BENLATE | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |

| Pesticide Library Cont. | | Use | Health Advisory(ppb) |
|---|---|---|---|
| Common Name | :BENSULIDE | H | |
| Partition Coefficient | :10000 mg/g OC | | |
| Half-Life | :60 days | | |
| Trade Name | :PREFAR | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :BENTAZONE | H | |
| Partition Coefficient | :35 mg/g OC | | |
| Half-Life | :10 days | | |
| Trade Name | :BASAGRAN | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :BROMOCIL | H | |
| Partition Coefficient | :72 mg/g OC | | |
| Half-Life | :106 days | | |
| Trade Name | :HYVAR XL | | |
| Trade Name | :BOROCIL | | |
| Trade Name | :UREABOR | | |
| Trade Name | :HYVAR X | | |
| Common Name | :BROMOXYNIL | H | |
| Partition Coefficient | :1000 mg/g OC | | |
| Half-Life | :14 days | | |
| Trade Name | :BROMINAL | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :CARBARYL | I | 700 |
| Partition Coefficient | :229 mg/g OC | | |
| Half-Life | :7 days | | |
| Trade Name | :SEVIN | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :CARBOFURAN | I | 36 |
| Partition Coefficient | :29 mg/g OC | | |
| Half-Life | :37 days | | |
| Trade Name | :FURADAN | | |
| Trade Name | :BAY 70143 | | |
| Trade Name | :YALTOX | | |
| Trade Name | :CURATERR | | |

| Pesticide Library Cont. | | Use | Health Advisory(ppb) |
|---|---|---|---|
| Common Name | :CHLOROTHALONIL | F | 1.5 |
| Partition Coefficient | :1380 mg/g OC | | |
| Half-Life | :20 days | | |
| Trade Name | :BRAVO | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :CHLORPYRIFOS | I | |
| Partition Coefficient | :6070 mg/g OC | | |
| Half-Life | :63 days | | |
| Trade Name | :LORSBAN | | |
| Trade Name | :DURSBAN | | |
| Trade Name | :BRODAN | | |
| Trade Name | :ERADEX | | |
| Common Name | :CHLORSULFURON | H | |
| Partition Coefficient | :1 mg/g OC | | |
| Half-Life | :30 days | | |
| Trade Name | :GLEAN | | |
| Trade Name | :TELAR | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :CYANAZINE | H | 9 |
| Partition Coefficient | :168 mg/g OC | | |
| Half-Life | :20 days | | |
| Trade Name | :BLADEX | | |
| Trade Name | :FORTROL | | |
| Trade Name | :SD 15418 | | |
| Trade Name | :WL 19805 | | |
| Common Name | :DAMINOZIDE | G | |
| Partition Coefficient | :10 mg/g OC | | |
| Half-Life | :7 days | | |
| Trade Name | :ALAR | | |
| Trade Name | :B-NINE | | |
| Trade Name | :KYLAR | | |
| Trade Name | :. | | |
| Common Name | :DCPA | H | 3500 |
| Partition Coefficient | :5000 mg/g OC | | |
| Half-Life | :100 days | | |
| Trade Name | :DACTHAL | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |

| Pesticide Library Cont. | | Use | Health Advisory(ppb) |
|---|---|---|---|
| Common Name | :DEMENTON | I | 35 |
| Partition Coefficient | :51 mg/g OC | | |
| Half-Life | :30 days | | |
| Trade Name | :METASYSTOX | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :DIAZINON | I | .63 |
| Partition Coefficient | :85 mg/g OC | | |
| Half-Life | :30 days | | |
| Trade Name | :SPECTRACIDE | | |
| Trade Name | :DIANON | | |
| Trade Name | :BASUDIN | | |
| Trade Name | :. | | |
| Common Name | :DICAMBA | H | 9 |
| Partition Coefficient | :2 mg/g OC | | |
| Half-Life | :14 days | | |
| Trade Name | :BANVEL D | | |
| Trade Name | :BANEX | | |
| Trade Name | :DIANAT | | |
| Trade Name | :WEEDMASTER | | |
| Common Name | :DICLOFOP | H | |
| Partition Coefficient | :48500 mg/g OC | | |
| Half-Life | :10 days | | |
| Trade Name | :HOELON | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :DIFENZOQUAT | H | |
| Partition Coefficient | :100000 mg/g OC | | |
| Half-Life | :90 days | | |
| Trade Name | :AVENGE | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :DIMETHOATE | I | |
| Partition Coefficient | :8 mg/g OC | | |
| Half-Life | :7 days | | |
| Trade Name | :CYGON | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |

| Pesticide Library Cont. | | Use | Health Advisory(ppb) |
|---|---|---|---|
| Common Name | :DISULFOTON | I | .3 |
| Partition Coefficient | :1603 mg/g OC | | |
| Half-Life | :5 days | | |
| Trade Name | :DISYSTON | | |
| Trade Name | :DITHIOSYSTOX | | |
| Trade Name | :THIODEMETON | | |
| Trade Name | :DITHIODEMETON | | |
| Common Name | :DIURON | H | |
| Partition Coefficient | :383 mg/g OC | | |
| Half-Life | :328 days | | |
| Trade Name | :KARMEX | | |
| Trade Name | :UROX D | | |
| Trade Name | :DIREX 4L | | |
| Trade Name | :DIUROL | | |
| Common Name | :ENDOSULFAN | I | |
| Partition Coefficient | :200000 mg/g OC | | |
| Half-Life | :43 days | | |
| Trade Name | :THIODAN | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :EPTC | H | |
| Partition Coefficient | :280 mg/g OC | | |
| Half-Life | :30 days | | |
| Trade Name | :EPTAM | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :FENVALERATE | I | |
| Partition Coefficient | :100000 mg/g OC | | |
| Half-Life | :50 days | | |
| Trade Name | :PYDRIN | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :FLUAZIFOP-P-BUTYL | H | |
| Partition Coefficient | :3000 mg/g OC | | |
| Half-Life | :20 days | | |
| Trade Name | :FUSILADE | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |

| Pesticide Library Cont. | | Use | Health Advisory(ppb) |
|---|---|---|---|
| Common Name | :FONOFOS | I | 14 |
| Partition Coefficient | :680 mg/g OC | | |
| Half-Life | :60 days | | |
| Trade Name | :DYFONATE | | |
| Trade Name | :N-2790 | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :GLYPHOSATE | 700 | |
| Partition Coefficient | :10000 mg/g OC | | |
| Half-Life | :30 days | | |
| Trade Name | :ROUNDUP | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :HEXAZINONE | H | 210 |
| Partition Coefficient | :11 mg/g OC | | |
| Half-Life | :60 days | | |
| Trade Name | :VELPAR | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :MALATHION | I | 140 |
| Partition Coefficient | :1797 mg/g OC | | |
| Half-Life | :1 days | | |
| Trade Name | :CYTHION | | |
| Trade Name | :CALMATHION | | |
| Trade Name | :CARBOFOS | | |
| Trade Name | :MERCAPTOTHION | | |
| Common Name | :MANEB | F | |
| Partition Coefficient | :1000 mg/g OC | | |
| Half-Life | :12 days | | |
| Trade Name | :DITHANE | | |
| Trade Name | :MANEB | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :MCPA | H | 3.6 |
| Partition Coefficient | :1000 mg/g OC | | |
| Half-Life | :30 days | | |
| Trade Name | :WEEDONE | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |

| Pesticide Library Cont. | | Use | Health Advisory(ppb) |
|---|---|---|---|
| Common Name | :METHIDATHION | I | |
| Partition Coefficient | :780 mg/g OC | | |
| Half-Life | :21 days | | |
| Trade Name | :SUPRACIDE | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :METHYL PARATHION | I | 2 |
| Partition Coefficient | :5102 mg/g OC | | |
| Half-Life | :5 days | | |
| Trade Name | :METAFOS | | |
| Trade Name | :PARATHION-METHYL | | |
| Trade Name | :DEVITHION | | |
| Trade Name | :NITROX 80 | | |
| Common Name | :METOLACHLOR | | |
| Partition Coefficient | :200 mg/g OC | H | 10 |
| Half-Life | :20 days | | |
| Trade Name | :DUAL | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :METRIBUZIN | H | 175 |
| Partition Coefficient | :41 mg/g OC | | |
| Half-Life | :30 days | | |
| Trade Name | :LEXONE | | |
| Trade Name | :SENCOR | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :METSULFURON | H | |
| Partition Coefficient | :61 mg/g OC | | |
| Half-Life | :120 days | | |
| Trade Name | :ALLY | | |
| Trade Name | :ESCORT | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :MEVINPHOS | I | |
| Partition Coefficient | :1 mg/g OC | | |
| Half-Life | :3 days | | |
| Trade Name | :PHOSDRIN | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |

| Pesticide Library Cont. | | Use | Health Advisory(ppb) |
|---|---|---|---|
| Common Name | :NAPTALAM | H | |
| Partition Coefficient | :30 mg/g OC | | |
| Half-Life | :7 days | | |
| Trade Name | :ALANAP | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :OXYDEMETON-METHYL | I | |
| Partition Coefficient | :1 mg/g OC | | |
| Half-Life | :20 days | | |
| Trade Name | :MSR | | |
| Trade Name | :METASYSTOX | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :OXYFLUORFEN | H | |
| Partition Coefficient | :100000 mg/g OC | | |
| Half-Life | :30 days | | |
| Trade Name | :GOAL | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :PARAQUAT | H | |
| Partition Coefficient | :100000 mg/g OC | | |
| Half-Life | :3600 days | | |
| Trade Name | :GRAMOXONE | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :PARATHION | H | 35 |
| Partition Coefficient | :1000 mg/g OC | | |
| Half-Life | :14 days | | |
| Trade Name | :THIOPHOS | | |
| Trade Name | :BLADAN | | |
| Trade Name | :ORTHOPHOS | | |
| Trade Name | :PANTHION | | |
| Common Name | :PERMETHRIN | I | |
| Partition Coefficient | :10600 mg/g OC | | |
| Half-Life | :30 days | | |
| Trade Name | :POUNCE | | |
| Trade Name | :AMBUSH | | |
| Trade Name | :. | | |
| Trade Name | :. | | |

| Pesticide Library Cont. | | Use | Health Advisory(ppb) |
|---|---|---|---|
| Common Name | :PHORATE | I | |
| Partition Coefficient | :1000 mg/g OC | | |
| Half-Life | :90 days | | |
| Trade Name | :THIMET | | |
| Trade Name | :RAMPART | | |
| Trade Name | :AGRIMET | | |
| Trade Name | :GEOMET | | |
| Common Name | :PHOSMET | I | |
| Partition Coefficient | :740 mg/g OC | | |
| Half-Life | :20 days | | |
| Trade Name | :IMIDAN | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :PROMETON | H | 100 |
| Partition Coefficient | :300 mg/g OC | | |
| Half-Life | :120 days | | |
| Trade Name | :PRAMITOL | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :PRONAMIDE | H | 52 |
| Partition Coefficient | :990 mg/g OC | | |
| Half-Life | :30 days | | |
| Trade Name | :KERB | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :PROPARGITE | M | |
| Partition Coefficient | :8000 mg/g OC | | |
| Half-Life | :20 days | | |
| Trade Name | :COMITE | | |
| Trade Name | :OMITE | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :SETHOXYDIM | H | |
| Partition Coefficient | :50 mg/g OC | | |
| Half-Life | :5 days | | |
| Trade Name | :POAST | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |

| Pesticide Library Cont. | | Use | Health Advisory(ppb) |
|---|---|---|---|
| Common Name | :SIMAZINE | H | 35 |
| Partition Coefficient | :138 mg/g OC | | |
| Half-Life | :75 days | | |
| Trade Name | :AQUAZINE | | |
| Trade Name | :PRINCEP | | |
| Trade Name | :SIMADEX | | |
| Trade Name | :SIM-TROL | | |
| Common Name | :TERBUFOS | I | .18 |
| Partition Coefficient | :3000 mg/g OC | | |
| Half-Life | :5 days | | |
| Trade Name | :COUNTER | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :TRIALLATE | H | |
| Partition Coefficient | :3600 mg/g OC | | |
| Half-Life | :60 days | | |
| Trade Name | :FARGO | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :TRIADIMEFON | F | |
| Partition Coefficient | :273 mg/g OC | | |
| Half-Life | :21 days | | |
| Trade Name | :BAYLETON | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Common Name | :TRIFLURALIN | H | 2 |
| Partition Coefficient | :1400 mg/g OC | | |
| Half-Life | :70 days | | |
| Trade Name | :TREFLAN | | |
| Trade Name | :TREFANOCIDE | | |
| Trade Name | :ELANCOLAN | | |
| Trade Name | :TRIM | | |
| Common Name | :TRIMETHACARB | I | |
| Partition Coefficient | :200 mg/g OC | | |
| Half-Life | :10 days | | |
| Trade Name | :BROOT | | |
| Trade Name | :. | | |
| Trade Name | :. | | |
| Trade Name | :. | | |

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