

## TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE    RENO, NEVADA    SOIL CONSERVATION SERVICE

JUNE 1993

AGRONOMY TECHNICAL NOTE NO. NV-62

SUBJECT: CPA - PERSONAL SAFETY IN HANDLING PESTICIDES

The attached Idaho Technical Note Agronomy No. 29 can be useful in discussions with individuals planning to apply pesticides on fields. With the emphasis on water quality, this type of knowledge will be needed. All employees need to be aware of the dangers of pesticides and how they can protect themselves.

*Larry W. Doughty*  
*for*

Jim W. Doughty  
State Resource Conservationist

# TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE      BOISE, IDAHO      SOIL CONSERVATION SERVICE

TN AGRONOMY No. 29

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## PERSONAL SAFETY IN HANDLING PESTICIDES

The single most important approach to pesticide safety is to read the pesticide label before each use and follow the directions given. If still in doubt after reading the label, contact a person qualified to help in evaluating the hazard of the chemical and its use. Qualified people include appropriate Extension specialists and chemical company representatives.

All pesticides are toxic and should be handled with care -- but even the most toxic can be used safely provided recommended precautions are followed.

### Health Hazards

Each season there are accidents, and in some years deaths, attributable to the misuse of pesticides. In case of accidents involving toxic pesticides, see your doctor at once. Your doctor may call one of the Consultation or Poison Control Centers. It will be of great help to your doctor to know exactly what pesticide is involved. The label on the container gives this information. Take along the entire pesticide container, or try at least to have the trade name of the pesticide and the EPA registration number.

### Protective Gear

Special protective gear is usually specified on the label when needed for especially hazardous chemicals or application situations.

These special precautions are based on the assumption that each person will be appropriately dressed on all occasions when using pesticides. It is obvious that open or porous-weave clothing; bare arms, chests, legs; and bare feet, sandals, or sneakers provide no protection at all from drift, spills, or other exposure to pesticides. No person should be so garbed when using agricultural chemicals. It is equally obvious that rubber boots will provide more protection than fabric cloth, and so on. Each person should carefully consider the nature and duration of his activity and choose protection appropriate to potential exposure -- rather than await development and enforcement of legal dress codes.

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Prepared by Floyd G. Bailey, State Conservation Agronomist.  
This information is from the 1990 Pacific Northwest Insect  
Control Handbook.

The minimum dress acceptable for personal protection and for maintenance of good discipline in handling pesticides includes; long-sleeved, closely-woven shirts, long-legged trousers, workboots, a hat with a brim capable of protecting the back of the neck (or hat with kepi), and waterproof gloves ("waterproof" means chemically resistant; the gloves can be made from various synthetic materials). We can not overemphasize the importance of gloves. Exposure studies of handlers and sprayers repeatedly show that by far the greatest fraction of exposure occurs on the hands. If a person works daily in the application of pesticides, basic safety discipline (and basic sanitation concepts) also require that the person bathe and launder clothes daily.

All respirators intended for use with pesticides must be approved jointly by the Mine Safety and Health Administration (MSHA) and the National Institute of Occupational Safety and Health (NIOSH). Approval numbers beginning with the letters TC must be on the box containing the face-piece. Cartridges and filters approved for pesticides are necessary and must have the TC number affixed to them plus the part number of the replacement part. Chemical cartridge respirators approved for pesticides will have the code number 23C following the letters TC, and gas masks will have the number 14G following TC. Respirators having numbers other than TC numbers (i.e. BM numbers) are no longer approved unless they can be upgraded to meet requirements through the use of appropriate cartridges and filters.

#### Take These Precautions

1. If you plan to apply any of the more dangerous pesticides, make sure your physician knows the types of compounds you are using. If you anticipate using the more toxic organic phosphorus materials, your doctor may suggest that you have a pre-season blood test to determine your normal cholinesterase activity level and suggest periodic cholinesterase tests during the spray season. He or she will then be in a better position to deal with a sudden illness. If your doctor should provide you with a supply of atropine tablets for organic phosphorus poisoning, do not take them before definite symptoms occur. If you ever take atropine tablets, call your physician as soon afterward as possible. Do not resume flying or operating ground equipment after taking atropine. Any person who is ill enough to receive a single dose of atropine tablets should be kept under medical observation for at least 24 hours, because atropine may produce only temporary relief of symptoms in what may prove to be a serious case of poisoning. Keep atropine tables away from children. An antidote for treating organic phosphorus poisoning, pralidoxime chloride (2-PAM) has been definitely proven to be a valuable supplement to atropine in the treatment of severe and moderately severe cases of organic phosphorus poisoning. It is available to physicians and hospitals through regular pharmaceutical channels.
2. Wear protective clothing, preferably water repellent, while spraying hazardous materials, as toxic pesticides can be absorbed into the body through the skin. Change and launder clothing and bathe daily.

3. Wear a respirator when loading or mixing concentrates and whenever pesticides may be inhaled.
4. Flammable empty containers may be burned if local regulations permit. Insure that smoke does not drift over nearby homes, people or livestock. Stand upwind of smoke. Do not burn containers which have held weed killers.
5. Keep your pesticide storage shed or room locked.
6. Do not smoke, chew tobacco, or eat while spraying. Wash hands before engaging in these activities .
7. Mix insecticides according to directions, and apply at the recommended rate.
8. Experience shows that poisoning occurs most often in hot weather. Spraying with the more toxic materials should be done during cooler periods insofar as possible. Extra care should be taken when it is necessary to spray during periods of high temperature.
9. Agricultural workers have been poisoned by working in orchards treated with parathion less than 48 hours earlier. Therefore, it is advisable to wait longer than 48 hours before beginning work in treated orchards. If possible, wait a week.
10. Extreme care must be taken in handling of insecticides. In the event of a spill, proper cleanup and disposal will prevent contamination to the groundwater and provide residuals below maximum allowable limits. Assistance in spill control may be gained through your local health departments (emergency dispatch through policy channels) and chemical dealers.
11. Cover crops treated with most pesticides should not be used as pasture or fed to livestock.
12. Agricultural workers should avoid eating unwashed chemically treated fruit and vegetables in the field. The time limitations from application to harvest have been established to protect the consumer from harmful residues. Disregard of these limitations presents a special hazard to the picker, grower and field person.

#### Organic Phosphorus and Carbamate Poisoning and Cholinesterase Evaluation

Organic phosphorus insecticides such as parathion, TEPP and Phosdrin are among the most toxic agricultural chemicals in use today. They are readily absorbed through the skin, digestive tract, and lungs, and great care should be taken while working with them.

These poisons are very dangerous because they bond themselves to an important body enzyme, cholinesterase. Cholinesterase is normally present in the blood -- it is necessary for proper nerve function. Inhibition or "tying up" of this enzyme causes excessive and uncoordinated nerve action.

Cholinesterase is normally present in far greater amounts than necessary for proper nerve action. Therefore, it is possible to absorb a quantity of an organic phosphorus insecticide without feeling ill effects; however, cholinesterase might be reduced to a dangerous level and further exposure may cause severe illness or death. Persons who are routinely exposed to these poisons should have their blood checked regularly in order to determine if a dangerous depression of cholinesterase has occurred.

The normal range of cholinesterase activity has been determined, but it varies considerably among individuals. Therefore, it is of considerable value to the physician to know an individual's normal level prior to exposure. If the cholinesterase level is found to be lower at some future date, the physician will be in a much better position to evaluate the significance of this level and its potential danger to the individual's health. In addition, routine tests serve to evaluate effectiveness of pre-cautionary measures exercised in the plant or field. These tests may detect unsuspecting exposure or carelessness which would eventually result in acute poisoning. Cholinesterase level testing can be done at:

#### IDAHO

Mercy Medical Center Laboratory  
1512 12th Ave. Rd.  
Nampa, Idaho 83686  
Phone: (208)467-1171

#### WASHINGTON

Regional Pesticides and Chemical  
Laboratory  
Department of Social and Health  
Services  
1719 Springwater  
P.O. Box 190  
Wenatchee, WA 98807  
Phone: (509)662-0484

#### Watch for These Symptoms

The initial symptoms of organic phosphorus and carbamate poisoning are giddiness, headache, nausea, vomiting, excessive sweating, and tightness of the chest. These are followed or accompanied by blurring of vision, diarrhea, excessive salivation, watering of eyes, twitching of muscles, especially in the eyelids, and mental confusion. One of the most characteristic signs is constriction of the pupils, but this may be preceded by dilation. Late signs are fluid in the chest, convulsions, coma, loss of urinary or bowel control, and respiratory failure. Repeated exposures to these compounds may, even without symptoms, increase susceptibility to poisoning.

The symptoms of poisoning by chlorinated hydrocarbon insecticides, such as lindane and endosulfan are primarily due to their effect on the nervous system and include hyperexcitability, tremors, and convulsions. General symptoms are malaise, headache, fatigue, and possibly lack of appetite and weight loss.

The symptoms for fumigant poisoning, such as methyl bromide, include mental confusion, double vision, tremors, lack of coordination, and slurred speech. These symptoms are similar to alcoholic intoxication. Severe exposure to fumigants may include skin burns, chemical pneumonia, and liver or kidney damage. Fumigants are extremely toxic gases if inhaled. Working with them in enclosed areas adds additional hazards.

#### What to do for Poisoning

1. In severe cases of organic phosphorus poisoning, breathing may stop. In such a situation, artificial respiration is the most important first aid until breathing has resumed.
2. Get the patient to a hospital or physician as soon as possible. Give artificial respiration on the way if the patient turns blue or stops breathing. If you know which pesticide may be involved, take along the label for the doctor's information. If the label cannot be removed easily, take along the entire pesticide container.
3. Never try to give anything to an unconscious patient by mouth.
4. If the insecticide has been swallowed, induce vomiting unless the label directs other action. In the case of a child, induce vomiting by stimulating the throat with the blunt end of a spoonhandle - - keeping the head in an inverted position.
5. Where excessive amounts of the insecticide, especially in concentrate form have come into contact with the skin, immediately remove all clothing and bathe the patient with generous amounts of soap and water, rinsing thoroughly.
6. If the eyes have been contaminated with spray, especially with insecticide concentrate, flush immediately with copious amounts of water, preferably with running or flowing water.
7. Make the patient lie down, and keep him or her warm.

The following page contains the address and telephone numbers of poison control centers in Idaho and surrounding states. It also lists the emergency telephone numbers of the important pesticide manufacturers.

## POISON CONTROL CENTERS

### OREGON

Oregon Poison Control  
The Oregon Health Sciences University  
Room 2519 University Hospital North  
3181 S.W. Sam Jackson Park Road  
Portland, Oregon 97201  
Phone: (503) 279-8968  
Oregon Toll Free: 1 (800) 452-7165

Emergency Department  
Sacred Heart Hospital  
1255 Hilyard  
Eugene, Oregon 97401  
Phone: (503) 686-6931

### IDAHO

Poison Control Center  
St. Alphonsus Hospital  
1055 N. Curtis Road  
Boise, Idaho 83706  
Phone: (208) 378-2707  
Idaho Toll Free: 1 (800) 632-8000

### NEVADA

Poison Control Center  
Washoe Medical Center  
77 Pringle Way  
Reno, Nevada 89520  
Phone: (702) 328-4129

### UTAH

Intermountain Regional Poison Control Center  
50 N. Medical Drive, Bldg. 428  
Salt Lake City, Utah 84132  
Phone: (801) 581-2151  
Utah Toll Free: 1 (800) 456-7707

### WASHINGTON

Spokane Poison Control  
St. Luke's Medical Office Bldg.  
S. 715 Cowley  
Spokane, Washington 99202  
Phone: (509) 747-1077  
Washington Toll Free: 1 (800) 572-5842  
Toll Free outside Washington 1 (800) 541-5624

Seattle Poison Center  
Children's Hospital  
4800 Sandpoint Way N.E.  
P.O. Box C5371  
Seattle, Washington 98105-0371  
Phone: (206) 526-2121  
Washington Toll Free: 1 (800) 732-6985

Mary Bridge Poison Center  
Mary Bridge Children's Hospital  
317 S. K Street  
P.O. Box 5299  
Tacoma, Washington 98405-0987  
Phone: (206) 594-1414  
Washington Toll Free: 1 (800) 542-6319

Central Washington Poison Center  
Yakima Valley Memorial Hospital  
2811 Tieton Drive  
Yakima, Washington 98902  
Phone: (509) 248-4400  
Washington Toll Free: 1 (800) 572-9176

### MONTANA

Rocky Mountain Poison and Drug Center\*  
645 Bannock  
Denver, Colorado 80204  
Phone: (303) 893-7774  
Montana Toll Free: 1 (800) 525-5042  
Colorado Toll Free: 1 (800) 332-3073

\*Montana hospitals will refer all calls to the Rocky Mountain Poison Center.

## MANUFACTURERS' POISON EMERGENCY TELEPHONE NUMBERS

*CHEMTREC (24 Hour) .....	800-424-9300	Mobay Chemical Corp.	
American Cyanamid Co. ....	201-835-3100	..... (8:30-4:30 M-F CST) .....	816-242-2000
Chemorse, Ltd. ....	515-276-1130	.....(other times).....	816-242-2582
Chevron Chem. Co. .... (Collect) .....	415-233-3737	Monsanto Chemical Co. ....	314-694-1000
CIBA Geigy Corp. ....	914-478-3131	PBI/Gordon	
Dow Chemical .....	517-636-4400	..... (8-5 M-F CST) .....	816-421-4070
DuPont Chemical .....	800-441-3637	..... (24 Hour) .....	913-342-8783
Fermenta Plant Protection .....	216-357-7070	Pennwalt Corp.	
FMC Corp. (24 Hour) .....	716-735-3765	..... (7-4 M-F CST) .....	409-779-0060
Griffin Ag Chemicals .....	800-237-1854	..... (other times) .....	409-846-2993
	912-242-8635	or 409-846-5535	
Hoechst-Roussel Agri-Vet Co.		Rhone-Poulenc .....	800-334-7577
.....(9-5 M-F EST).....	201-231-2630	Rohm and Haas Co. (24 Hour) .....	215-592-3000
	or 201-463-4771	Sanag, Div. of Sanitek .....	213-245-6781
.....(other times).....	201-658-4647	Sandoz Crop Protection Corp. ....	312-699-1616
	or 201-828-9390	Stoller Chem. Co. .... Day .....	713-461-2910
ICI Americas, Inc. (24 Hour) .....	800-456-3669	Uniroyal Chemical Co. ....	209-224-8910
Gramoxone-Paraquat (24 Hour) .....	800-327-8633	..... Spills .....	203-573-3871
Merck & Co. ....	215-661-7300	..... (24 Hour) .....	203-723-3670
*CHEMTREC, the Chemical Transportation Emergency Center, advises principally on pesticide spills.		Wilbur Ellis Co. .... (7-6 M-F CST) .....	800-221-6580