

Safety Manual Chapter 12

Pesticides - Issue Date 8/76

12-01 Federal Environmental Pesticide Control Act

The Federal Environmental Pesticide Control Act (the Federal Insecticide, Fungicide, and Rodenticide Act of 1947, as amended in 1972) regulates the use of pesticides to protect humans and the environment. It does so by extending federal controls to the actual application of pesticides by the user, and by regulating both intrastate and interstate marketing of pesticide products.

12-02 Illinois Laws and Regulations

There are several laws regulating the use of pesticides in Illinois, and several state agencies are involved in their administration.

12-03 Pesticides Control Act

The Pesticides Control Act designates the State Departments of Agriculture and Public Health as responsible for controlling the labeling, sale, use, and application of pesticides to prevent the contamination of water and the environment.

12-04 Applicators

Applicators shall follow all Federal, State, and local rules and regulations in regard to use and application to provide a safe environment to applicator and to the general public.

12-1.1 Types of Pesticides

A pesticide is any chemical used to destroy, prevent, or control pests. Often the word "insecticide" is mistakenly used interchangeably with the word "pesticide." An insecticide, however, is simply one type of pesticide. Fungicides, herbicides, and rodenticides are also kinds of pesticides.

12-1.11 Insecticides

Insecticides are chemicals used to control insects and other related animals such as ticks, spiders, centipedes, and mites. Some insecticides kill only a few kinds of insects. Many more insecticides are general purpose or wide-range killers. These broad-spectrum insecticides are used when several different kinds of insects are a problem.

12-1.12 Fungicides

Fungicides are chemicals used to prevent or control fungi that cause rots, leaf spots, blights, mildews, rusts, and other plant diseases.

12-1.13 Herbicides

Herbicides are classified as selective or nonselective, depending upon how they are used for weed control. Selective herbicides kill certain plants with little or no injury to agronomic, vegetable, range, turf, or horticultural crops. Nonselective herbicides are used where selectivity is not intended or desirable, as in noncrop weed control.

12-1.14 Rodenticides

Rodenticides are chemicals used to control rats, mice, and other rodents.

12-1.15 Nematicides

Nematicides are chemicals used to control nematodes. Nematodes are tiny, hairlike worms that often live in the soil and feed on plant roots.

12-1.16 Fumigants

Fumigants are pesticides or mixtures of pesticides that produce vapors. Fumigants are used to control rodents, nematodes, weeds, and plant diseases.

12-1.2 Pesticide Compatibility

When two or more pesticides can be safely mixed together or used at the same time, they are said to be compatible. Some pesticides are incompatible because they will not mix chemically. Incompatible pesticides may, when mixed, combine chemically and form another compound.

12-1.21 Toxicity and Hazards of Pesticides

Pesticides are poisonous. They have to be poisonous to kill undesirable plants, insects, diseases, or other pests. Safe and proper use of pesticides depends upon a knowledge of their toxic properties and a respect for the potential hazards associated with their use.

12-1.22 Toxicity

Toxicity is the inherent capacity of a pesticide to produce injury or death. If you know the toxicity of a pesticide, you will know what precautions to take. Highly toxic pesticides contain a drawing of a skull and crossbones and words "Danger-Poison" on the label. Moderately toxic pesticides contain the word "Warning" on the label; and pesticides with low and slight toxicity contain the word "Caution" on the label.

12-1.23 Hazards

Do not depend upon toxicity values alone as a measure of the hazard of a pesticide to humans or other animals. You must also be concerned with the hazards associated with exposure to the pesticide. Hazard and toxicity are not the same. Hazard is a combination of toxicity and exposure.

12-1.3 Human Pesticide Poisoning

Although pesticides are designed to control pests, they are also toxic (poisonous) to desirable plants and animals, including humans. Many pesticides are so highly toxic that very small quantities can kill a person, and exposure to a sufficient amount of almost any pesticide can make a person ill. Even the fairly safe pesticides can irritate the skin, eyes, nose, or mouth.

12-1.31 Exposure to Pesticides

Chronic exposure to a low-level exposure over a longer period of time results in effects that are like a mild, slow poisoning.

12-1.32 Acute exposure - spilling pesticide on yourself.

Before a pesticide can harm you, it must be taken into the body orally (through the mouth and digestive system); dermally (through the skin); or by inhalation through the nose and respiratory system. Both acute and chronic exposure can result from pesticides entering your body through any of these routes.

12-1.33 Oral Exposure

Oral exposure may occur because of an accident, but it is more likely to be the result of carelessness. Blowing out a plugged nozzle with your mouth, smoking or eating without washing contaminated hands, or eating fruit that has been recently sprayed with a pesticide can result in oral exposure.

12-1.34 Dermal Exposure

Dermal exposure is skin contamination. It can occur any time a pesticide is mixed, applied, or handled, and it is often undetected. Its seriousness depends on (1) the dermal toxicity of the material; (2) the rate of absorption through the skin; (3) the size of the skin area contaminated; and (4) the length of time the material is in contact with the skin.

12-1.35 Inhalation Exposure

Inhalation exposure results from breathing in pesticide vapors, dust, or spray particles. Like oral and dermal exposure, inhalation exposure is more serious with some pesticides than with others.

12-1.36 Organophosphates

The organophosphates are involved in more cases of occupational poisoning and deaths than any other single group of pesticides. The symptoms of poisoning by organophosphates progress through several stages.

- The usual sequence of symptoms for mild poisoning is as follows: fatigue; headache; dizziness; numbness in the arms or legs; nausea and vomiting; excessive sweating and salivation; and the abdominal cramps or diarrhea.
- In moderate poisoning, the symptoms listed for mild poisoning become more severe. Additional symptoms for moderate poisoning include inability to walk; generalized weakness; difficulty in talking; muscular twitches; and contraction of the pupil of the eye.
- The symptoms for severe poisoning are unconsciousness; severe contractions of the pupil of the eye; muscular twitches; secretions from the mouth and nose; and respiratory difficulty. If victims of severe poisoning are not treated immediately, death will usually result.
- Illness is frequently delayed several hours, and a victim may first become sick at home after supper. If symptoms begin more than 12 hours after the last known exposure to the pesticide, illness is probably due to some other cause.

12-1.37 Carbamates

The carbamates likely to cause illness through occupational exposure act in the same way as the organophosphates, and produce the same type of poisoning symptoms.

12-1.38 Chlorinated Hydrocarbons

Only a few organochlorines have caused occupational poisoning. Early symptoms of poisoning include headache, nausea, vomiting, general discomfort and dizziness.

12-1.4 Treatment of Pesticide Poisoning

First aid is the initial effort to help a victim while medical help is on the way.

12-1.41 Poison of the Skin

Drench the victim's skin and clothing with water. The faster the poison is washed off, the less injury will result.

12-1.42 Poison in the Eyes

It is important to wash the eyes out as quickly but as gently as possible.

12-1.43 Inhaled Poison

If the victim is in an enclosed space, do not go in after him without an air-supplied respirator. Open all doors and windows. Carry the victim (do not let him walk) into the fresh air immediately.

12-1.44 Swallowed Poison

The best first-aid treatment for a person who has swallowed a pesticide is to give him large amounts of plain water or milk.

12-1.5 Safe Handling of Pesticides

12-1.51 Protective Clothing and Equipment

All protective clothing and equipment shall be furnished by the University. Pesticides can enter the body through many routes. The most common is through the skin contact. To prevent absorption through the skin, the applicator must wear a protective barrier. No safety recommendations can cover all situations. Always read the pesticide label for recommendations on the use of protective clothing and safety devices. When using any pesticides, wear at least a hat, coverall garment and wear rubber gloves and goggles.

12-1.52 Gloves

Unlined, liquid proof gloves (rubber or neoprene) should be worn when handling a pesticide concentrate or using organophosphates, carbamates, or other chemicals with the signal words "Danger-Poison" or "Warning" on the label.

12-1.53 Boots

Lightweight, unlined rubber boots should be worn when handling or applying highly or moderately toxic pesticides.

12-1.54 Care of Clothing and Equipment

Wear a clean set of clothing each day that you spray. If fabrics become wet with dilute spray during the day, they should be changed. If clothes get wet with liquid concentrates or highly toxic pesticides, they should be discarded.

Respirators provide protection from inhaling toxic chemicals. They should be worn whenever the more toxic organophosphate (TEPP, parathion, Guthion, DiSyston, Thimet, Phosdrin) or carbamate (Furadan, Temic) pesticides are applied. The label will indicate if a respirator is needed.

12-1.55 Chemical Canister Respirator (Gas Mask)

A gas mask should be worn when mixing or applying toxic pesticides in enclosed or poorly ventilated areas.

12-1.56 Mixing and Loading Pesticides

Before handling a pesticide container, put on the correct protective clothing and other necessary protective equipment. Each time you use a pesticide, carefully read the directions, for mixing before removing the material from the container. Pesticides should be mixed out of doors in a place where there is good light and ventilation.

12-1.6 Applying Pesticides

A pesticide applicator is not only responsible for his own protection but also for the protection of other people, domestic animals, and the environment. You cannot afford to be careless!

12-1.61 Avoid Exposure

Do not work in spray drift or runoff unless you are properly protected.
Do not apply chemicals when drift is likely to occur. Select application equipment, formulations, and adjuvants that will minimize drift hazard.

12-1.62 Safe Reentry Time

It is dangerous for people to enter an area after certain pesticides have been used. The time that must pass before the area is safe to enter is known as the "reentry time". This time, which should be listed on the pesticide label, varies according to the pesticide applied and the crop or area treated.

Whenever pesticides are used indoors, a warning shall be posted on the entrance containing "Danger - Positively No Admittance Toxic Environment". Such warning shall remain in place for such time period as indicated on label. During this time NO ONE shall enter.

12-1.7 Storing Pesticides

- Store pesticides and pesticide containers in a separate building, room, or enclosure, depending upon the size of your pesticide inventory.
- Use an exhaust fan for ventilation in storage rooms to reduce the temperature and high concentrations of toxic fumes.
- Do not store pesticides near food or other stored products. Restricted use pesticides should never be given to anyone.

12-1.8 Labels and Labeling

12-1.81 Information on the Label

- Trade (Brand) Name
- The trade or brand name is the manufacturer's name for the product.

12-1.82 Common and Chemical Names

The common name for a pesticide is a name agreed upon to identify an active ingredient in the product. A pesticide manufactured by more than one company may be sold under several brand names, but it always has the same common name.

12-1.83 Ingredients

Every label must list the amounts of active and inert (inactive) ingredients in the formulation.

12-1.84 Use Classification

- All pesticide labels must contain a statement of the use classification assigned by the EPA at the time of registration.
- A general use pesticide is one that will not harm the applicator or the environment to an unreasonable degree when it is used exactly according to directions.
- A restricted use pesticide is one that could harm the environment or the applicator even when used as directed.

12-1.85 Directions for Use

The label lists only registered (legal) uses for the pesticide. Remember - it is illegal to use any pesticide in a manner inconsistent with the directions on the label.

12-1.86 Precautionary Statements

The pesticide label also contains certain precautionary statements concerning hazards to the applicator, children, domestic animals, wildlife, and the environment.

12-1.87 Reading the Label

12-1.871 Before you buy a pesticide, read the label to determine:

1. Whether it is the pesticide you need for the job. Never buy a pesticide simply on the basis of the color of the label or the produce name.
2. Whether the pesticide is too hazardous to be used safely under the application conditions.

12-1.872 Before you mix the pesticide, read the label to determine:

1. What protective equipment you should use.
2. What the pesticide can be mixed with compatibility.
3. How much pesticide to use.

12-1.873 Before you apply the pesticide, read the label to determine:

1. What safety measures you should follow.
2. Where the pesticide can be used (livestock, crops, structures, etc.)
3. When to apply the pesticide (including the waiting period for crops and animals.)
4. How to apply the pesticide.
5. Whether there are any restrictions for use of the pesticide.

12-1.9 Medical Care

12-1.91 In case of an exposure of an academic, non-academic, and/or student employee to a pesticide while engaged in University work, he should report at once to his supervisor and go to the University Health Service where medical services are offered an employee. An accident report form must be completed by the injured employee and/or supervisor as outlined in Section 9-1. This procedure will safeguard his interests under the Illinois workmen's Compensation Act and/or Occupational Diseases Act.

12-1.92 Periodic examinations and/or clinical tests are available at the Health Service.

12-1.93 Medical surveillance tests shall be run on anyone who handles or applies any pesticides by the Health Service.

12-2 Notice to Building Occupants/Posting of Outdoor Signs

12-2.1 Whenever possible, the occupants of a building to be treated with pesticide shall be given 24 hours notice prior to treating the building.

The occupants of a building which has been treated with pesticide shall be given warning that the building has been treated by posting signs on the entrances to the area treated.

12-2.2 Whenever outdoor areas are treated with pesticide, warning signs shall be posted at the edges of the treated area, in accord with state law