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G90-1007 Pesticide Management and Safety on Home Grounds

John C. Fech

University of Nebraska - Lincoln, jfech1@unl.edu

Larry D. Schulze

University of Nebraska - Lincoln, lschulze1@unl.edu

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Pesticide Management and Safety on Home Grounds

Pesticides can be valuable tools in controlling lawn and garden pests. They must be used according to the label, with regard for the safety of people and animals.

John C. Fech, Extension Agent, Horticulture
Larry D. Schulze, Extension Pesticide Coordinator

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Pest infestations often develop in lawns or gardens, damage lawns and ornamentals, and reduce the attractiveness of the home setting. When an infestation occurs, gardeners can reach a decision in pest management by answering the following questions: What is the pest? Is the pest causing unacceptable damage? Are controls needed? What pest control method(s) should be used?

There are several methods of pest control. The main methods of pest control and some examples for each are: cultural (*cultivation, mulching, rotation*), biological (*natural predators*), mechanical (*trapping, vacuuming*), sanitation (*pest-free seeds*), and chemical (*pesticides*).



This NebGuide concentrates upon the management and safety of pesticides for pest control on home grounds. An understanding of pesticide management by the applicator helps ensure safe and effective use of these products.

It is important to understand the meaning of the word "pesticide." It is a general term, referring to any substance or mixture of substances that destroys pests, controls their activity or prevents them from causing damage. Some pesticides either attract or repel pests. Others regulate the growth of plants or animals.

As there are many types of pests, there are many kinds of pesticides. Insecticides control insects, herbicides control weeds, fungicides control fungi, rodenticides control rodents and so on.

Pest Control Strategy

Proper pesticide selection begins with identifying the pest. Don't panic just because a strange insect is present. Most insects are harmless and pose no threat. If help is needed to identify an insect, weed or disease, consult an Extension agent, garden center/lawn care personnel, or use library references.

After the pest is identified, determine if the number of pests or their damage warrants the use of a pest control method. This will vary with the plant species and pest involved. Use a control method only when it will prevent the pest from causing more damage than it is reasonable to accept.

A good question to ask is: Will there be enough damage from these pests to justify a pesticide application - yes or no? For example, yellow nutsedge can be quite disruptive to turf, causing reduced uniformity and density, resulting in decreased aesthetic appeal and ability to prevent soil erosion. If the nutsedge infestation is sufficiently disturbing, identify and evaluate all available control methods. Hand pulling or use of postemergence herbicides are possibilities.

In this case, pulling individual plants requires only an inconsequential effort, but is not a good choice because pulling tends to increase the weed population due to inherent establishment mechanisms of nutsedge. The other options are much more viable.

A nonselective postemergence herbicide such as glyphosate (Roundup, Kleenup) followed by renovation can be used if more than 40-50 percent of the turf is nutsedge. If less is present, selective postemergence herbicides such as bentazon (Basagran) or methanearsonate (DSMA, MSMA) can be applied.

The presence of ash aphids on an ash tree is a second example. The level of aphid infestation can be quite high, but chemical control of the aphids is rarely required. If an insecticide is applied, it is usually for cosmetic purposes only, and not for an economic concern.

The best pesticide choice is one which provides the maximum reduction of a pest population while causing a minimum amount of environmental damage. For example, in attempting to control cabbage worms in the garden, possible solutions include synthetic substances such as malathion or carbaryl (Sevin) as well as a naturally-occurring disease organism called *Bacillus thuringiensis* (Bt). Bt is quite effective against cabbage worms and is safe to the environment.

Pesticide Guidelines

Read the pesticide label. This cannot be overemphasized. Labels list the registered site or location for use, pests controlled, active ingredients, directions for use, precautions, protective equipment needs, and storage and disposal information. Read and follow label directions for proper use of a pesticide.

Any use of a pesticide that violates statements on the label is illegal. This law applies to everyone, including commercial applicators, and is intended to prevent the misuse of pesticides. Apply pesticides only to a site (lawn, ornamental, vegetable, etc.) that is identified on the label. More information on label components is available in NebGuide G89-937, *The Pesticide Label*.

The Risk Formula. Certain risks are inherent in life. Some are more acceptable than others. The risk in handling and using pesticides is manageable. The risk is a function of product toxicity and the potential for personal exposure. The Risk Formula is:

Risk = Toxicity x Exposure.

Knowledge of a pesticide's toxicity and the potential for personal exposure allows a user to manage the risk. If exposure is low enough, risk can be acceptable. Note that toxicity alone does not determine the risk of using a product. The application of the Risk Formula to gasoline is an example. It is very toxic when ingested, but can be handled safely. The product's toxicity is not changed, but the risk in handling it can be managed.

No matter how toxic a substance may be, if the degree of exposure is kept low enough, risk can be maintained at an acceptable level.

Pesticide Exposure

Any measure taken to minimize pesticide entry into the body is advantageous. There are three routes of entry of a pesticide into the body: oral exposure (mouth), dermal exposure (absorption through the skin and eyes), and respiratory exposure (inhalation through the lungs). Read the label for specific protective equipment guidelines. The **Statement of Practical Treatment** on the label provides specific actions related to the method of exposure.



The most common method of contact with pesticides is dermal exposure. It is also the easiest route to prevent. Good personal hygiene and protective equipment are fundamental to proper pesticide use.

Oral exposure, although not common, can be the most serious exposure because of the rapid uptake in the body. Never eat, drink or smoke while handling pesticides. Don't expose food or water to pesticides, and wash with soap and water before eating or drinking.

Personal Protective Equipment

The use of personal protective equipment is essential for pesticide safety. See the label for guidelines. Protective equipment includes unlined gloves (nitrile, rubber, or neoprene). Cloth-lined garden gloves should not be worn when handling pesticides. They cannot be cleaned inside and out. Do not use common latex gloves. Pesticide carriers such as petroleum distillates, acetone, or xylene will soften latex gloves and not provide protection.

Wear rubber boots over shoes so the leather or cloth will not absorb liquid pesticide. Goggles and neoprene aprons are inexpensive and should be worn when recommended by the label.

Pesticide Application Equipment

Several types of application equipment are available to the homeowner. Some examples are hose-end sprayers, drop spreaders, rotary spreaders, pressure sprayers, aerosol containers, and more.

All equipment has some limitations, making it necessary to have access to several types. The situation and specific pest problems often dictate which type of application equipment to use. Unless specifically prohibited on the label, any application method is allowed when applying pesticides. For example, a liquid lawn weed control product can be applied with a hand pump sprayer, a sprinkling can, a bottle with a trigger sprayer or a paint brush.

The chemical may also indicate the type of equipment to use. For example, most formulations of benomyl (a fungicide) are wettable powders. A wettable powder is generally incompatible with a hose-end sprayer, so benomyl should be applied with a pressure tank sprayer.

Protect the Environment

Our environment is our surroundings: air, water, soil, plants and wildlife. All pesticide users have the responsibility to use pesticides correctly. Pesticides can be a tool to protect the environment when used carefully, wisely, and judiciously. Consider the following environmental factors when using pesticides:

Temperature. Volatility, a change in the physical state such as from liquid to gas, is influenced by temperature. It increases with increasing temperatures. Liquid lawn weed control products applied at ambient temperature above 85 degrees F have a heightened chance of volatilization, which can cause injury to nearby susceptible plants. Apply these products in the morning when air temperatures tend to be cooler.

Rain or Irrigation. Pesticides applied to a lawn right before substantial rain or irrigation may not be effective in controlling the target pest. As an example, a herbicide that controls growing broadleaf weeds in a lawn needs to stay in contact with the weeds' leaves after application. Rain or irrigation too soon after the herbicide application removes the product from the weed and greatly reduces its effectiveness.

Don't apply pesticides if a rain is forecast within 24 hours of application. This is especially important when spraying fungicides on fruit trees or herbicides on growing lawn weeds.

Wind. Wind can drift pesticides to nontarget sites. An example is a lawn herbicide that blows onto a neighbor's fruit or vegetable garden. The amount of pesticide lost from the target area and the distance it moves both increase as wind velocity increases.

A general rule of thumb is: *do not spray a pesticide when wind velocities are greater than 10 miles per hour.* Such wind is a gentle breeze that produces constant but light motion of twigs and leaves. Also, keep in mind the wind direction. Select a time when there is little wind (usually early morning) or the wind blows gently away from susceptible plants.

Water Resources. Once applied, a pesticide may move off the intended site if good management practices are not followed. Run-off can be caused by excessive irrigation or rain upon an area that has just received a pesticide application. A balance is often required. Some pesticides require a certain amount of water after application to move the product into the soil where it will be effective against the pest.

Run-off water (because of excess rain or irrigation) away from the application site can contaminate surface water resources. Pesticides can be moved off-site in the water solution or while attached to soil particles during soil erosion. If the soil is coarse or sandy, excess water also can move pesticides downward through the soil profile.

Mixing and Applying Pesticides

Formulations. Mixing different kinds of pesticides may be possible, depending on the formulation of each pesticide and if not prohibited on the label. Most wettable powders can be mixed together.

Emulsifiable concentrates and wettable powders are not compatible. Mixing them can result in a sticky, cottage cheese-like substance that clogs spray nozzles.

Before mixing any quantities, test a pesticide combination by combining a small amount of each in a jar of water. Agitate the jar and observe the product. If the result has the appearance of cottage cheese or sludge, don't use that combination.

A recent trend in pesticide marketing is the ready to use (RTU) formulation, which does not require mixing or diluting before application. These low concentration formulations may be a good way for many people to apply pesticides, because dermal (skin) contact with a pesticide while mixing is the major route of exposure to people. RTU products often cost more than equivalent concentrated formulations because of the cost of transporting increased volumes of water or diluent in the commercial product.

Calibration. All pesticide applications should be applied according to the rate on the label. Be aware of the size of the application area and the quantity of pesticide material needed to cover that area. Calculate the specific amount of pesticide needed to cover that area.



Often, a specific setting for a drop or rotary spreader is given. Follow it. For liquid concentrations, dilute according to the label. Always maintain pesticide applicators in good condition.

The application of the right pesticide at the right time and at the proper rate is important to prevent contamination of the environment. The correct calibration rate is one factor the applicator can control.

Disposal. Mix only the amount of pesticide you will use at any one time.

Avoid excess. The best way to dispose of small amounts of a leftover pesticide mixture is to apply it to a different part of the same site or location. Excess pesticide may be used on a different pest if the product is registered for that site or location.

When a pesticide container is empty, disposal is necessary. Always rinse liquid containers three times. Use the rinse water to dilute the mixture in the sprayer. Puncture metal and plastic containers. Triple-rinsed containers may then be disposed of at a sanitary landfill according to local regulations. Empty dust or wettable powder containers should be punctured and then made available for landfill disposal.

Keep written records of all pesticide use. They will help you gauge the effectiveness of a particular application, and improve pest control. Keep these records for three or four years.

Pesticide Storage. Proper facilities are needed to store any pesticide. Store pesticides in a secure place, preferably locked, and away from food, children and pets. In some cases, the label may warn that you must store the pesticide where it will not freeze. Always store pesticides in their original containers. No pesticide may be stored in an unmarked container, such as a bottle or can.

The Applicator is the Key

Pest control is a straightforward process. It begins with identifying the pest, evaluating any damage the pest may be causing, and determining if any control measures are needed. If a chemical control is selected, always read and follow the pesticide label for proper mixing, safe handling, accurate application, and proper storage and disposal.

To simplify information, trade name products have been mentioned. No endorsement is intended, nor is criticism implied of similar products not mentioned.

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