K-STATE
Research and Extension

Common Sense Pest Control
YARD CARE AND THE ENVIRONMENT

Pesticides are chemicals used to kill or repel pests. Pesticides include herbicides (which kill plants), insecticides (which kill insects), and fungicides (which kill fungi).

The pesticides used in a yard may pose a health threat to the person applying them if not handled carefully and properly. They may also pose a threat to animals, plants and insects beyond the intended pests. Honeybees are an example of a nontarget organism. Bees are very susceptible to many household pesticides such as carbaryl (Sevin). Other nontargets include ladybird beetles, which are a natural biological pest control, and fish, which can suffer direct poisoning from the household insecticides permethrin, resmethrin, pyrethrin, and rotenone washed into a stream or lake.

Chemicals we apply to the land surface can affect the groundwater. Contamination may occur when polluted surface water moves through the soil to the water table.

This fact sheet describes a variety of non-chemical methods of pest control. It also provides tips for using pesticides in an environmentally sound way.

Integrated Pest Management

When we see weeds or insects invading our favorite plants, our first response is often to apply a pesticide. Some people even apply a pesticide to prevent invasion by pests. Both of these automatic responses lead to unnecessary pesticide use. A better approach is Integrated Pest Management (IPM).

IPM is an ecological approach to pest management that integrates cultural, mechanical, biological and, as a last resort, chemical control methods.

Steps to follow in IPM:

1. Learn about plants and their pests.
2. Select the right plant for the location.
3. Frequently inspect plants to see if pest levels are increasing or decreasing. Usually, each plant species will be attacked by only a few insect pests and pathogens.
4. Identify pest symptoms. Knowledge of pests, their life cycle and the damage they cause is essential for effective pest management.
5. Determine if control measures are really needed. For example, this can be determined by counting the number of insects present and looking carefully at the amount of damage they are causing. Most plants can tolerate a considerable amount of feeding by insects before any serious damage occurs.

6. When treatment becomes necessary, select methods that are least disruptive to natural controls and least hazardous to human health and the environment. Start with cultural, mechanical, or biological controls.
7. Evaluate your treatment to see which methods worked best.

Cultural

Cultural pest control methods attempt to create optimal growing conditions for plants and unfavorable conditions for pests.

For Gardens

- Select disease-resistant varieties.
- Plant varieties adapted to the geographic and soil conditions.
- Maintain a rich, fertile soil, with the proper pH for the plants being grown.
- Rotate vegetable garden plants to disrupt the life cycle of pests (called crop rotation).
- Plant and harvest early to promote healthy, strong plants and avoid peak insect populations.
- Remove pest-infected plant residue in the fall.
- Plant a wide variety of crops to reduce potential pest problems (known as crop diversification).
- Evaluate plant success against water required during the growing season and the availability of sunlight. Most garden plants need plenty of each to help control pest problems.

For Lawns (mow as high as possible)

- Proper mowing heights are important and need to be set according to the publication, MF-1155, *Mowing Your Lawn*.
- Mow often, each time the grass reaches 3 to 4 inches. (It's important not to cut more than one-third of the height).
- On troublesome spots, remember that improper light, moisture or soil conditions discourage good turf. Use of shade-tolerant grasses, bringing in topsoil, or switching to alternative groundcovers may be the key.

Biological

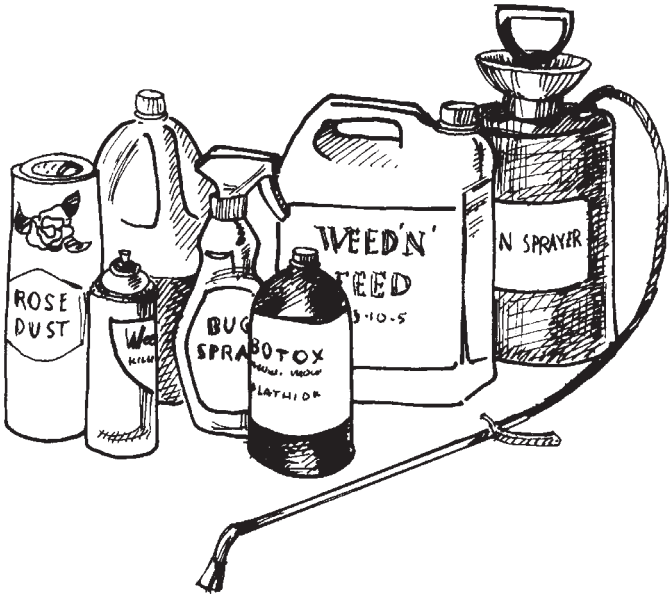
A number of organisms feed on or infect insect pests. These biological controls frequently prevent the insect population from reaching damaging levels. Three types of natural enemies are:

- Predators – such as ladybird beetles, ground beetles and birds that consume many pests in their lifetime.
- Parasites – such as the trichogamma wasp, which will generally consume one individual insect pest during its own lifetime.
- Pathogens – such as fungi, bacteria, and viruses, which infect many insect pests simultaneously.

Minimizing the use of pesticides on lawns and gardens allows these natural enemies to thrive, helping to keep pest populations in check.

Mechanical

- Practice the vanishing art of hand-weeding. When health, expense, environmental consequences, and even time are considered, small problems with lawn weeds are handled in no better way.
- Use tillage of the soil in weedy areas, rather than herbicides.



- Like hand-weeding, a few large insects (such as certain caterpillars) may be easily removed by hand in little time and at no expense, or environmental or health risk.
- Use mulches to reduce weed problems, conserve moisture, and prevent soil erosion.

Chemical

When you have accurately identified a pest in damaging numbers (above the plant's tolerance threshold), and other controls have failed or are impractical, carefully choose a pesticide. Pesticides are usually effective only during certain stages of a pest's life and at specific concentrations. If possible, select a pesticide that is "pest-specific," that is, designed to kill only the insects, weed and disease organisms causing the damage. Less toxic pest control products are available and include:

- Microbial insecticides – Those derived from microorganisms such as *Bacillus thuringiensis*.
- Inorganic insecticides – Some oils and soaps kill pests on contact and pose little threat to the environment. Insecticidal soaps destroy pest membranes and are effective against soft-bodied insects.

Note: Botanical pesticides derived from plants, such as *rotenone, nicotine, ryania, pyrethrum,* and *sabadilla* may not be any safer to people or nontarget organisms than many synthetic insecticides. They are, however, short-lived and break down quickly in the environment.

Pesticide Application

Use pesticides only when other control methods fail. Extensive use of pesticides can kill beneficial organisms that help keep pest populations under control.

- Read the label carefully – it tells how, when, and where to use the product.
- Apply the amount specified on the label and apply only to the plants and areas listed. Over-application is a waste of money and an environmental hazard.
- Wear protective clothing as directed on the label. Do not wash clothing contaminated with pesticides with other clothing.
- Make sure the pesticide is designated for use on the pest you want to control.
- Do not mix different pesticides unless instructed by the product directions.
- Keep pesticides in their original containers, so you know what they are and how to use them. (This is law.)
- Do not apply pesticides if rain is imminent (unless specified on the label). Some pesticides do need to be watered-in after application, but rain or watering can wash others off plants, decreasing effectiveness, and contaminating lakes and streams. (Read the label.)
- Never spray pesticides on breezy days. The spray drifting in the wind poses a serious danger to nontarget plants and animals — including those in the neighbors' yards.
- Never apply pesticides to highly erodible areas. When it rains, pesticides can easily be washed off these sites with eroding soil.
- Never apply pesticides near wells, streams, ponds or marshes unless instructions specifically allow for such uses.

Pesticide Storage and Disposal

- Don't buy more pesticide than you need. Disposal can be a problem.
- Store pesticides where children and pets can't get to them.
- Never dispose of excess pesticides by dumping them on the ground. While pesticides are broken down to nontoxic compounds by microorganisms, excessive amounts applied to the soil can "overload" this natural system. They can contaminate drinking water.
- Consider sharing leftover pesticides with neighbors, as long as they have a properly diagnosed pest problem that is not easily treatable through other means.
- Never dispose of unwanted pesticides in the ditch, gutter storm sewer or toilet. Such practices allow the hazardous chemicals to move directly into streams and lakes where they can harm fish and wildlife. In addition, pesticides dumped down the drain can kill beneficial organisms that help purify the waste water in treatment plants of a septic system.
- Take advantage of your designated pesticide collection site.
- When a pesticide container is empty, fill it with water three times, each time pouring the rinse water into the spray tank when preparing the solution for final application. Triple-rinsing is important, because some chemical residues may remain in a container even though it appears empty.
- Dispose of empty, triple-rinsed pesticide containers as instructed on the label. Small containers can be wrapped in layers of newspaper or in a plastic bag and placed in the garbage on the day of pickup. Never burn or bury empty pesticide containers. The fumes from burning pesticide residues may be toxic. Buried containers could leak pesticides into drinking water.

Thinking Twice and Acting Sensibly

When pests invade lawns and gardens, consider the full range of pest control options. In many cases, pesticides will not be necessary. When pesticides must be used, follow label directions carefully to minimize harm to people and beneficial plants and animals.

For more information on alternative pest control methods and proper application of pesticides, contact your local K-State Research and Extension office.

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Adapted from material by the University of Wisconsin–Extension and Department of Natural Resources.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-2135 November 2012