

1 try pesticide alternatives



Protect the Chesapeake Bay

Like farmers, homeowners play an important role in protecting our soil and water resources, especially the Chesapeake Bay. This series of fact sheets highlights various conservation measures—best management practices—that farmers use to produce healthy crops and protect water quality in the Chesapeake Bay and its tributaries. Homeowners can apply these same conservation measures to home, lawn, garden, and landscape projects. Working together, we can make a difference for the Bay. For more information on ways to improve your lawn or garden and protect the Bay, contact the organizations listed on the back panel.



What You Can Do Without Pesticides

Only a handful of the many insects in an average yard or garden are considered pests. Most plants can tolerate some insect damage without significant loss to yield or appearance. Whenever possible, choose insect and disease resistant varieties of garden plants and turfgrasses. Remember, the goal is to make your lawn or garden a healthy place for preferred plants and insects. If you decide that you have a pest problem that requires attention, use the least toxic method of control—don't simply reach for the spray bottle at first sight of an insect, weed, or disease.

Physical Controls

- ✿ Prune out heavily infested plant parts and diseased branches. This is very effective against localized infestations of scale insects and tent caterpillars.
- ✿ Place a protective floating row cover of polypropylene on vegetables to form a physical barrier against insects. Remove the cover in the morning for insect-pollinated crops, such as summer squash and cucumbers.
- ✿ Place stiff paper tubes or wrap aluminum foil around young vegetable or flower transplants to stop cutworms.
- ✿ Wash insects and mites off plants with a stream of water instead of pesticide sprays.
- ✿ Hand-pick insect pests and slugs and destroy egg masses.
- ✿ Place flat boards next to plants to attract slugs. When slugs crawl under the boards to escape sunlight, lift the boards and discard the slugs.



Principles of Integrated Pest Management

Many farmers rely on Integrated Pest Management (IPM) to manage insects and weeds with fewer pesticides. IPM requires frequent pest monitoring for infestation or crop damage. A range of management strategies is used only if pests reach threatening levels or begin to cause serious crop or plant damage. Many of the options used in IPM are available through local garden shops, mail order catalogs and the Internet.



Preventive Measures

- ✿ Plant a variety of flowers and herbs near vegetable gardens to attract pollinators and beneficial insects.
- ✿ Place bird and bat houses in the garden. Birds and bats consume hundreds of insects daily.
- ✿ Time plantings to avoid peak periods of infestation. Set out squash transplants early to avoid borers that lay eggs in June. If planting a second squash crop, sow after mid-July.
- ✿ Keep gardens free of debris such as dead plants, discarded bricks, or brush piles to limit hiding places for insect pests and slugs.
- ✿ Remove crop debris from the garden following the harvest. Dead plants provide winter hiding places for insects and diseases.
- ✿ Tilling garden soil can disrupt some over-wintering insect pests, exposing them to predators and harsh weather.
- ✿ Cover tilled soil with leaves or plant a cover crop such as crimson clover to revitalize the soil and control erosion in winter.



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Office of Resource Conservation
50 Harry S. Truman Parkway
Annapolis MD 21401
410-841-5863
mda.maryland.gov/fertilizer

 HOME & GARDEN
Information Center
UNIVERSITY OF MARYLAND EXTENSION
12005 Homewood Road
Ellicott City, MD 21042
extension.umd.edu/hgic

 GROW IT EAT IT
Maryland's Food Gardening Network
extension.umd.edu/growit



Disease Inhibitors

- ✿ Choose plants that are resistant to diseases.
- ✿ Rotate vegetables and annual flowers so that the same plant does not occupy the same area every year.
- ✿ Space and prune plants to improve air circulation and quicken leaf drying following watering.
- ✿ Water lawns and gardens early in the day; watering at night encourages disease. Substitute drip irrigation for overhead watering.
- ✿ Keep disease from spreading—remove infected plants or prune out diseased parts.



Less-Toxic Alternatives

When used according to the label instructions, these products are less toxic and persistent than other commercially available products. Most are available at local nurseries and home improvement centers. When possible, buy ready-to-use products (RTUs).

✿ Insecticidal Soaps

Can be sprayed directly on garden plants and shrubs to kill a variety of pests on contact, including spider mites, whiteflies, aphids, mealybugs, and scale insects.

✿ Pyrethrum, Neem and Spinosad

These naturally derived insecticides can help control a range of insect pests. Read and follow all product label directions prior to use. Spray directly on the pest, since these products also will kill bees and other beneficial insects. To further protect pollinators, avoid spraying plants with open flowers.

✿ Horticultural Oils

Can be sprayed on plants during dormancy to kill overwintering insects and mites. During the growing season, these oils can be used to control spider mites, aphids, and whiteflies on ornamentals.

✿ Bt (*Bacillus thuringiensis*)

A biological insecticide that can be used to control young caterpillars, including the larvae of the imported cabbageworm.



Garden Friend or Foe? Learn to Tell the Good Bugs from the Bad Bugs

Not all insects are unwanted pests in your lawn and garden. There are many “beneficial” insects that will prey on garden pests. By growing plants that give them food and shelter, minimizing pesticide use, and providing alternative ground covers, you can attract beneficial insects to your lawn or garden.

GARDEN FRIENDS



DRAGONFLIES

Large, colorful insects that dart and hover over ponds. They have large eyes that occupy most of the head and two pairs of wings that may be plain or patterned. Dragonflies catch and eat their prey in flight.



HOVER OR SYRPHID FLY

Resembles a small bee. The adults hover around nectar sources and their larvae feed on aphids, mealybugs, and other small insects.



LACEWINGS

Lacewings prey on aphids, whiteflies, thrips, and mites. Adults are green or brown, with small heads and large eyes. The larvae are spindle-shaped, yellow to brown.



LADYBIRD BEETLES (LADYBUGS)

The ladybird beetle and its larvae eat aphids, mealybugs, scales, and other small insects.



LIGHTNING BUGS (FIREFLIES)

This garden friend is easily recognizable on summer evenings as large groups light up the sky. Firefly larvae eat snails and slugs.



PARASITIC WASPS

Parasitic wasps vary in size and attack a variety of caterpillars, beetle larvae, flies, and aphids.



PRAYING MANTID

Will eat anything they happen upon, including each other.



SOLDIER BEETLES

Adult soldier beetles are usually found on flowers. The larvae prey on cutworms, gypsy moth larvae, slugs, and snails.



SPIDERS

Prey on anything they can capture.



APHIDS

This garden foe feeds by sucking the sap from stems or leaves and may transmit plant diseases. Parasites and predators can usually control them. Virtually every plant has at least one aphid species that attacks it.



BROWN MARMORATED STINK BUG

An invasive species that feeds on many hosts causing damage to fruits and vegetables.



GARDEN SLUG

One of the most despised garden pests, slugs eat leaves, stems, flowers, and roots. Small seedlings in the garden are especially vulnerable. Slugs prefer cool, moist hiding places during the day. Wet conditions favor slug problems.



IMPORTED CABBAGEWORM

A common pest of cabbage, broccoli, cauliflower, kale, kohlrabi, mustard, radish, and turnip plants. The adult cabbageworm is a white butterfly with several black spots. It emerges in early spring to lay tiny yellow eggs on the undersides of leaves.



SCALE INSECTS

These small, usually legless insects are often hidden by a waxy cover. They attack trees, shrubs, and houseplants. Some secrete a honeydew that attracts ants.



SPIDER MITES

This garden foe is barely visible to the unaided eye. Spider mites suck the contents of individual plant cells causing leaves to look dirty or stippled.



STRIPED CUCUMBER BEETLE

Striped cucumber beetles emerge early in the season and often eat young seedlings of cucumbers, squash, pumpkins, and melons. Adults feed on leaves, vines, and fruits and transmit bacterial wilt disease.



WHITEFLIES

A major threat in greenhouses, whiteflies also attack many garden plants, including tomatoes.



If You Must Use Pesticides...

Pesticides can be toxic to humans, animals, plants, and fish. Choose the least toxic pesticide that will be effective for your problem and always read the entire label before applying a pesticide to your lawn or garden. A product labeled *Caution* means it's slightly toxic. *Warning* means the product is moderately toxic. The words *Danger* or *Poison* accompanied by a skull and crossbones mean the product is extremely toxic. Here are some other important guidelines to follow when using pesticides:



- ✿ Use pesticides as part of the IPM approach, not as a “cure-all.”
- ✿ Identify the pest and severity of injury to the plant. Select the proper product as a last resort only.
- ✿ Buy only the amount of pesticide that you need, for the present pest problem.
- ✿ Apply the product according to label instructions at the time indicated. Use the proper amount in the frequency specified, and only for the purpose and conditions outlined.
- ✿ Buy ready-to-use products (RTUs) and avoid concentrates if possible. If mixing is required, follow label procedures precisely.
- ✿ Wear all protective clothing specified on the label.
- ✿ Do not apply insecticides to plants in bloom.
- ✿ Do not spray in the morning, when bees are active.
- ✿ Never apply pesticides to bare ground or eroded areas.
- ✿ Never apply pesticides near streams, ponds, wells, or wetlands.
- ✿ Use kitty litter to soak up small spills and dispose in a tightly-sealed plastic bag.
- ✿ Wash hands immediately after applying any pesticide.
- ✿ Store pesticides in a locked, dry, well ventilated area—out of the reach of children.

