

# ORGANIC PEST AND DISEASE MANAGEMENT

Insects of all kinds are an essential part of a healthy garden ecosystem. Few of them—under 5 percent of common species—cause damage to your plants. Pest insects are often attracted to weak or diseased plants. When the destructive bug population reaches troublesome levels, you want to restore balance without resorting to tactics that could harm other living things. Likewise, plant diseases can be contained without harsh chemical treatments. Organic strategies not only avoid adding toxins to the environment, they are effective and easy to use.

## Observation Check

When you see insects on or around your plants, watch what they're doing. Are they causing any damage? Holes or discolored spots on leaves or fruit, wilting, and stunted growth are a few of the common symptoms of pest infestations. Fungal diseases tend to appear as dark spots or they can leave a white or black coating on foliage. Droopy, wilted plants might be suffering from a viral disease. Note the specifics of any symptoms you see so you can get a positive identification of the troublemakers and respond appropriately.

## Natural Resistance

When choosing plants for your garden, look for varieties that have been selected for their innate responses to common pests and diseases. For instance, the classic Jersey tomato, 'Ramapo', does not suffer from verticillium and fusarium wilts, while thrips are not attracted to 'Rossa Di Milano' onions.

## Good Guys

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## Food Chain

Birds, bats, toads, lizards, and snakes gobble up many types of pests, too. Set up bird and bat houses, bird feeders, and bird baths to invite your winged allies to hang around your garden. Leave some uncultivated areas where reptiles can find shelter between meals.

## Rotation Solution

If you plant the same vegetables in the same spots year after year, the pests and diseases have no trouble finding them. Many overwinter in the soil from one season to the next. Insects often lay their eggs near where they've been feeding. Switch up the types of crops you grow and where you plant them to reduce the risk of potential problems.

## Restricted Access

You can block pests from getting to your plants with physical barriers. For example, cardboard tubes (*sliced from paper towel rolls*) protect seedlings from cutworms. Row covers made from fabric allow air and light to reach your crops but prevents insects from damaging them. Crawling pests, such as slugs, can't get past a ring of diatomaceous earth spread on the soil.

## Set Traps

Colorful sticky traps and bands snare pests that are attracted to particular hues—aphids and whiteflies land on yellow, while thrips aim for blue. You can buy pre-made traps from garden suppliers or make your own with cardboard, wood, or plastic coated with Tanglefoot, a vegetable-based product. Sticky bands around tree trunks capture caterpillars and other crawlers before they reach the limbs. You can also find pheromone traps that lure in a variety of species, including moths and armyworms. Be aware that popular electric "mosquito zappers" don't work on the biting pests because they are not attracted to light.



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## Beneficial Bacteria

*Bacillus thuringiensis* (known as *Bt*) is a naturally occurring bacteria that stops pests from feeding but is not harmful to other living things. You'll find several varieties, which work on different pests, so be sure you get the right one. *Bt kurstaki* targets caterpillars, including tomato hornworms. *Bt israelensis* controls mosquitoes, fungus gnats and black flies and *Bt san diego* works on cucumber beetles. The different *Bt* types come in powder or liquid form, which you spray on plant leaves.

## Soap and Oil

Many insects have a protective coating that can be washed off with soap, causing them to dehydrate. You can buy specially formulated insecticidal soap or use dishwashing liquid (see below for basic recipes). Horticultural oil smothers pests such as scale, mites, and mealybugs. Be sure to get vegetable-based (rather than petroleum) oils and follow timing directions. Neem oil is extracted from the seeds of the neem tree that is native to India. The oil acts as a repellent and feeding disrupter to mites, caterpillars, leafhoppers, and more -- but is safe for people, pets, and wildlife. Before spraying whole plants with soap or oil formulas, try them on a few leaves first and wait a day to make sure they are not causing harm.

## New Pest in Town

The spotted lanternfly (*Lycorma delicatula*) is a large planthopper that's native to China, Vietnam, and India. The first U.S. sighting was in Berks County, Pennsylvania in 2014, which has since quickly spread and become a troublesome pest in our region. Spotted lanternflies feed on a wide variety of crops and shade trees, causing large weeping wounds, thwarted growth, and even death. The insects also secrete "honeydew," leaving behind sooty mold growth on leaves.

There are currently no controls for spotted lanternflies—chemical or organic—except sticky bands on trees. The Pennsylvania Department of Agriculture and researchers are working to track and prevent the pests' spread. The adults are hard to miss—they are 1-inch long and have distinctive, black-spotted gray forewings and bright red underwings. If you see them or their eggs (*gray masses with a mud-like covering that cracks and browns with age*), take photos and submit your sighting to [BadBug@pa.gov](mailto:BadBug@pa.gov). Then collect the specimens, double bag, and dispose of them. It is also perfectly acceptable to step on them to kill them if you are quick-footed!

## Homemade Sprays

### Soft-bodied pests such as aphids and thrips

Mix 1 tablespoon mild liquid dishwashing soap and 1 tablespoon of vegetable oil in 2 quarts of water

### Chewing pests such as flea beetles and caterpillars

Puree ½ cup chopped chile peppers (the hotter the better) with 2 cups water. Let sit overnight, strain, then mix in 1 tablespoon vegetable oil. Dilute with 1 quart water, pour into spray bottle, and coat leaves.

### Blackspot and other fungal diseases

Stir 1 tablespoon baking soda, 1 or 2 drops liquid dishwashing soap, and 1 tablespoon vegetable oil into 2 quarts water. Spray on tops and bottoms of leaves.

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