

## Organic Pest-Control Techniques

Once you've identified the troublemakers, you can control them with an assortment of organic pest-control products. Some of these are preventative measures that you can use if you get the same pests year after year. These techniques are not listed in any particular order.

### 1. Floating Row Cover

This translucent, white, porous polyester fabric acts as an insect barrier, while letting in up to 80 percent of the available light. You can buy either lightweight or heavyweight types—you'll want to use the lighter one for controlling pests in summer, because it will keep out bugs without cooking your plants. The heavier row cover traps more warmth and so is better for season extending.



*Photo credit raisedbeds.com*

The material is sold by the yard, generally in rolls 4 to 8 feet wide. You cut it to the length you need, then drape it over metal hoops, attach it to wooden supporting frames, wrap it around wire tomato cages, or simply lay it directly on your crops like a blanket. **Important:** You must secure the edges of the row cover with soil, U-shaped pins (either commercial or homemade ones crafted from wire coat hangers), boards, bricks, sandbags, or rocks.

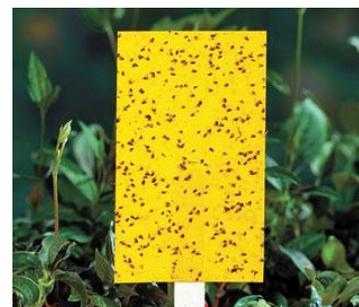
Use floating row covers as temporary barriers to get plants past critical stages, such as when they are seedlings or while the pest you are deterring is most active. Of course, you could keep the crop covered for its entire life span, although this isn't a good option for crops that require insect pollination for fruiting.

**Pests controlled:** Row covers are especially useful against mobile pests, including cabbage moths (imported cabbageworms), Colorado potato beetles, most aphids, Mexican bean beetles, flea beetles, squash bugs, and tomato hornworms. Combine row covers with crop rotation if you're dealing with pests that overwinter in the soil.

## 2. Sticky Traps

These traps—a rigid material of a particular color (usually yellow) that's coated with a sticky substance—are used to catch insects that are attracted to that color. Use at least one trap (hung at plant height and close to the plant) every 3 to 5 feet.

You can buy packaged sticky traps or make them yourself. To make your own, use any rigid material of the right color (for colors, see below) or that you can spray paint. Cut the material to size (4 × 6-inch rectangles are the standard), and if needed, paint it the correct color. Cover the trap with a plastic bag or clingy plastic wrap, then coat it with a sticky substance, such as Tangle-Trap. The plastic wrap makes cleanup easy—when your trap is covered with bugs, just remove the plastic and rewrap the trap with a new piece of plastic. Then coat it with more sticky stuff.



*Photo credit parkseed.com*



*Photo credit deerflytrapumbrella.blogspot.com*

For cucumber beetles, use a mobile trap: Wrap clingy plastic food wrap around a white bucket or other large object, then coat the plastic with Tangle-Trap. Carry the bucket along the rows of vines, shaking and brushing the plants as you go. The beetles will fly up and stick to the traps.

**Pests controlled:** Yellow traps attract whiteflies, fruit flies, male winged scales, leafhoppers, fungus gnats, midges, male winged mealybugs and leafminers, thrips, psyllids, and winged aphids. White traps lure whiteflies, plant bugs, cucumber beetles, and flea beetles. Light blue traps attract flower thrips, and red spheres attract the flies whose eggs hatch into apple maggots.

## 3. Hand-picking

Larger insects such as squash bugs and cabbage loopers can be identified early on and pulled off your plants before the populations get too big. Check seedlings before transplanting and check the undersides of leaves for common pests early and often. Pick insects off your plants and drop in soapy water (or squish!). Leaf miners can be controlled early by cutting off and disposing of any leaf with visible signs of leaf miners – chances are, the leaf miner is still inside the leaf.



*Photo credit dengarden.com*

**Pests controlled:** caterpillars such as cabbage loopers and tomato hornworms, leaf miners, aphids (if caught early), squash bugs, cucumber beetles, and squash vine borers.

#### 4. Create habitat for or release beneficial insects



Insects such as ladybugs (\$20-\$60 depending on quantity), praying mantis eggs (\$5), and parasitic wasps can be purchased online and released into your garden to offer natural management of many common pests.



**Pests controlled:** Ladybugs will take care of aphid populations, praying mantises will consume aphids, caterpillars, various beetles, mosquitoes, whiteflies, and more.

*groworganic.com*

#### 4. Insecticidal Soap

Insecticidal soap contains unsaturated long-chain fatty acids (derived from animal fats) that dissolve the skin of insects. Insecticidal soap sprays are commercially formulated products sold specifically for insect control. (Don't confuse these products with herbicidal soaps, which kill vegetation instead of insects, or household soaps, which are detergents.)

To be effective, the insecticidal soap must come in contact with the insects while it's still liquid—it has no effect after it dries on the plants. Spray only on pests and try to avoid hitting beneficial insects with the spray. Caution: Insecticidal soap can burn some plant leaves. Test each type of plant before spraying the entire plant. Spray a few leaves, then wait 48 hours. If there's no damage, go ahead and spray the entire plant. Don't spray on hot days, and rinse the soap off your plants after a few hours if the plants are receiving a lot of sunshine. If you have hard water, mix the soap with distilled water to help the soap dissolve.

**Pests controlled:** Insecticidal soap sprays are highly effective against mites, aphids, whiteflies, and other soft-bodied insects as well as the softer nymph stages of some tough-bodied bugs.



*Photo credit johnnyseeds.com*

#### 5. Neem Oil Spray

Neem oil spray works by suffocating pests and reducing their appetite. To be effective, the oil spray must hit the pest (or their eggs) directly, which are often on the underside of the leaves. Use oils such as neem oil as a "dormant oil," on the bare branches of trees and shrubs during the dormant season to kill insect pest eggs and disease spores.

To avoid plant damage, don't spray any plants suffering from moisture stress. Also, don't spray on very hot days. Test the spray on just a few leaves before you spray the entire plant. Wait 48 hours to make sure no leaf spotting or discoloration occurs.



*Photo credit groworganic.com*

To minimize potential harm to beneficial insects, limit your spraying to small areas where you can see pests lurking, and leave a couple of unsprayed "refuges" for any good bugs you can't see. Protect nectar-feeding beneficials by not spraying during peak flowering times and by not spraying blossoms. Spray early in the morning, before bees become active. And if you plan to release beneficials, do it after you apply the oil spray.

**Pests controlled:** Use neem oil to combat aphids, mites, beetles such as squash bugs, leaf miners, caterpillars, thrips, leafhoppers, and whiteflies.

## 6. *Bacillus Thuringiensis*

*Bacillus thuringiensis* (BT) is a naturally occurring bacterium found in the soil. There are many different types, and some can be used to kill a specific insect or class of insects. When a target insect takes a bite of a plant sprayed with the type of BT the insect is sensitive to, the insect gets infected and stops feeding. Inside the insect, the bacterium releases a protein that causes the pest to die within a few days.



*Photo credit groworganic.com*

Each type of BT is effective only on one specific insect (or group) and only on insects that actually eat it. However, that doesn't mean you can spray it indiscriminately. For example, the type that kills cabbage loopers can also kill the caterpillars of the beautiful butterflies you're trying to attract to your garden. Only spray it when you know you have a pest problem, and only spray the pest-infested plants.

Most formulations of this bacterium are sold as a liquid or wettable powder that you dilute with water and then spray on the plants you want to protect. Some products are sold in the form of dusts or granules that you dust directly on plants.

Because BT usually is effective only against the non-adult stage of pest insects, you must time applications carefully. As soon as you spot the pest larvae (aka caterpillar), thoroughly coat the affected plants with the spray or dust. (For corn pests, deposit a little of the granular product into the whorl or on the corn silk.) Avoid spraying during the heat of day. BT breaks down a day or two after spraying, so you may need to reapply it if you're up against a severe infestation. As with all sprays or dusts, always wear goggles and a mask to prevent contact with the bacterium when you apply it to your plants (there have been a few reports of allergic reactions in those who have inhaled it).

**Pests controlled:** The most common strain of the bacterium—BT var. *kurstaki* (sometimes called BT var. *berliner*)—kills hundreds of different kinds of caterpillars, including cabbage loopers, tomato hornworms, cabbageworms, corn earworms, European corn borers, and squash vine borers. BT var. *tenebrionis* (a new name—until recently this one was called BT var. *san diego*) kills Colorado potato beetles.

## 7. Parasitic Nematodes

Don't confuse these beneficial nematodes with destructive root-knot nematodes. Once inside a pest, parasitic nematodes release bacteria that kills the insect host within a day or two. Although these good nematodes occur naturally in the soil, there usually aren't enough of them in one place to control pests that have gotten out of hand in your garden. But you can buy them by the billions for use as a living—and organic, safe, and nontoxic—form of pest control.



*Photo credit groworganic.com*

The dormant nematodes are shipped in a moist medium, which you mix with water when you're ready to apply. When you receive a shipment, put the sealed container in your refrigerator until you are ready to use it (the nematodes will keep there for about 4 months). Try to use them as soon as possible, though; their effectiveness declines the longer you store them. Once the nematodes are mixed with water for application, they are only viable for a very short time. Use all of the mix within a few hours—don't try to save any of it.

Apply the nematodes to moist soil that has reached a temperature of at least 60°F, either in the evening or when it's overcast, at a rate of about 23 million nematodes per 1,000 square feet. Thoroughly cover the area with the nematodes, then water them in. Exception: If your pest is in the plant (the squash vine borer or corn earworm), mix up a small batch of nematodes and use a garden syringe or eye-dropper to apply them just inside the tip of the ear of corn, or into the squash vine entrance holes.

**Pests controlled:** Nematodes attack and invade armyworms, corn earworms, squash vine borers, soil-dwelling grubs (including Japanese beetle larvae), weevils, root maggots, and cutworms (in their soil-dwelling stages).