

# Home Garden Series

# Organic Insect Management



## A Guide to Minimizing Insect Infestation and Damage in the Home Vegetable Garden

### What are insects, and why is it critical to control them in the vegetable garden?

Insects are defined as small arthropod animals that have six legs and generally possess one or two pairs of wings. Insects can damage all plant structures in vegetable crops. Insects can also transmit vector diseases and bacteria into plants as they feed on them. Controlling insects can help a gardener produce better-yielding and more visually appealing fruit and vegetables to share or sell.

### What is the difference in organic and synthetic insect control?

- **Organic control** is when a gardener uses natural insecticides to reduce insect populations.
- **Synthetic control** is when a gardener uses man-made insecticides to reduce insect populations.

### Cultural practices to reduce insect populations in the home vegetable garden

Scout your garden at least once a week for pest problems. That way if you see a problem, you can fix it early. Do your best to identify the pest. Not all insecticides control all insects, and not all insects are harmful to plants. Therefore, you'll want to identify the pest first before spraying. If you cannot find the insect, be able to describe the damage. For instance, descriptions such as, "It looks like bites were taken out of the leaf," or "The damage looks like tiny holes," help an extension professional identify your pest.

Healthy plants are generally less susceptible to pests. You can optimize plant health by improving

the soil through additions of compost, organic fertilizers and organic matter like leaves and pine straw. Water plants judiciously and avoid drought stress if at all possible.

If you have weak plants, pull them out. You can reduce the likelihood of pests living in your garden by clearing out old plant debris and weeds and disinfecting your tools after touching a diseased plant.

If the weather allows, you may want to consider planting your crops early. This allows the plants to reach maturity faster before insect pressure becomes too high.

Crop rotation is strongly suggested. Certain plants belong to the same family. For example, tomatoes, eggplants, peppers and potatoes are all in the same family and should not be planted in the same row season after season. Instead, rotate where each family is planted.

### The families of common home garden crops include:

- **Alliums:** onions, garlic, leeks and shallots
- **Umbellifers:** carrots, celery, parsley and parsnips
- **Asters:** lettuce, sunflowers and a few other leafy greens
- **Brassica:** cabbage, broccoli, Brussels sprouts, kale and many other leafy greens as well as rutabagas and kohlrabi
- **Amaranth:** beets and chard
- **Cucurbits:** cucumbers, melons, squash and gourds
- **Legumes:** peas and beans
- **Grass (Poa):** corn, wheat, oats and rye
- **Solanaceae:** tomatoes, peppers, eggplant and potatoes

When planning your vegetable garden, consider the mature size of the crop in relation to spacing. Avoid planting seeds or seedlings too close together. For example, tomato seedlings start off small but will grow at least 2 to 3 feet across. Plenty of space should be given between each plant to encourage air flow. If plants are too close together it could encourage disease. Proper spacing will ensure your plants are not crowded and may encourage vigorous growth.

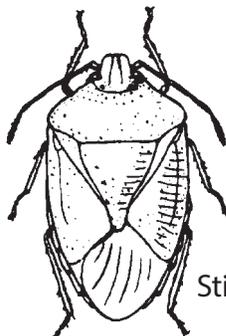
Carefully consider how you will mulch your garden. Pine straw and leaves are excellent organic mulches for the garden. Avoid barks, which can rob plants of nutrients.

## Using beneficial insects to control pest insects

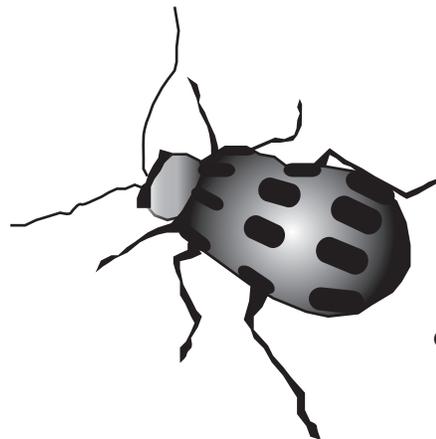
Beneficial insects are natural predators of insect pests, meaning they eat insects and not plants. Some beneficial insects do not eat insects but

are considered beneficial because they pollinate crops, including butterflies and bees. Lady beetles — commonly referred to as ladybugs — crawl all over our vegetables but never damage them. Instead, they eat soft-bodied insects such as aphids and mealy bugs that not only physically damage crops but also transmit plant diseases. For beneficial insects, like lady beetles, to work as a method of insect control, you must first identify your problem insect (pest) and then determine which beneficial insect will work the best. As the population of the pest insect declines, so will the beneficial insect. Beneficial insects will move from your garden to other places in search of food. Thus, beneficial insects generally need to be purchased each year as a means of control. Beneficial insects can be purchased at local plant nurseries and from online sources. Remember, beneficial insects are susceptible to both organic and non-organic insecticides. You will want to limit spraying insecticides or not spray at all when using beneficial insects.

Pest Insect	Beneficial Insect(s) Typically Used for Control
Aphid	Lady beetles, green lacewings
Slug	Beetles, toads, frogs, birds
Mealy bug	Lady beetles, green lacewings
Thrips	Lady beetles, green lacewings, assassin bugs
Caterpillars, worms, loopers	Birds, yellow jackets, moles
Stink bugs	Assassin bugs, wasps
Plant bugs	Lacewings, assassin bugs, wasps
Weevils	Fire ants, spiders, wasps
Whiteflies	Lady beetles, lacewings



Stink bug



Spotted cucumber beetle

## Organic Insecticides 101

There are a few organic insecticides available to homeowners. Below are descriptions of insects and which methods of control — including which organic pesticides — may work best.

### Common organic insecticides

- *Bacillus Thuringiensis*
- Diatomaceous earth\*
- Horticultural soaps
- Kaolin clay\*
- Neem oil
- Pyrethrum
- Plant oils

\*Organic Materials Review Institute approved with some restrictions

### Slugs

Control slugs by hand picking or sprinkling diatomaceous earth around the base of plants. Diatomaceous earth is made from fossilized diatoms and works through abrasion and desiccation. Homeowners can also use beer traps. Beer traps work by attracting slugs to the trap by smell. Partially bury a small container and fill it with fresh beer at dusk and then check the container in the morning to see how many slugs are caught. Remember not to bury the container completely. This will keep the beneficial insects from getting caught in the trap.

### Squash bugs

These insects can be found mainly on squash and pumpkins. They are often confused with stink bugs, but stink bugs are wider and rounder than squash bugs. Control squash bugs by handpicking the eggs off the undersides of leaves. Adults can usually be found on the undersides of leaves or near new growth. Spraying neem oil or pyrethrum is an effective way to control squash bugs. Once the squash or pumpkins are finished producing for the season, remove all old plants and clean up any debris that fell on the ground. This will help reduce injury to next season's crop. Squash bugs overwinter in old leaf material.

### Aphids

Spray insecticidal soap, horticultural oil or soapy water on aphids. Take care to wash the soap off

after 10 to 15 minutes or apply soaps on cloudy days. Oils and soaps can burn plant foliage in hot, sunny weather. You can dislodge aphids from plants by spraying them with water from a garden hose. Attract beneficial insects, like lady beetles, to your garden. They are natural predators of aphids.

### Caterpillars and worms

Worms will frequent any member of the Brassica family, including kale, broccoli and cauliflower. Worms can be difficult to locate. Look for the frass (worm droppings) on the tops of leaves. Consider planting thyme around cabbage or broccoli. Worms are repelled by phytochemicals produced by thyme. Use *Bt* (*Bacillus thuringiensis*) to control worms or caterpillars. *Bt* is a naturally occurring bacterium that when sprayed on plants and eaten by worms will kill the worms in a few days.

### Squash vine borers

Use row covers to reduce the instance of borers on squash until the blossoms open. Once the blossoms open, remove the covers. Avoid planting squash in the same row year after year. Practice crop rotation because borers overwinter as pupae in soil. Clean up all old plant and weed debris.

### Tomato hornworm

Handpick hornworms off tomato plants whenever possible. Look for caterpillar frass on the tops of leaves. Frass resembles small black pebbles. The braconid wasp is a parasitoid of the hornworm and provides excellent control of caterpillar pests. Applications of *Bt* and pyrethrum will control hornworms. Cultivate the soil at the beginning and end of the growing season to destroy larvae overwintering in the soil.

### Cutworms

Place a cardboard collar around each plant to prevent cutworms from eating the base of affected plants. Put the collar on immediately after planting. Cutworms like to consume young plants. Consider using an old roll of toilet paper as the cardboard collar. Scout your garden and pick cutworms off plants as you see them. Applications of *Bt* and pyrethrum provide satisfactory control of cutworms.

### **Cucumber beetles**

Management of cucumber beetles in field trials using organic chemicals has been inconsistent. Neem oil, pyrethrum and spinosad can be applied using a backpack sprayer. Using plastic mulch is a good way to discourage pests from dwelling in your garden. Pick a plastic mulch that is silver on one side and lay the silver mulch face up. Silver will reflect the sunlight onto the bottom of the leaves and discourage the bugs from staying in your garden. Remove and discard all old plant material. Beetles overwinter in old leaf litter.

Cultivate the soil to expose beetles hiding in the soil.

### **Stink bugs**

Vacuum stink bugs from plants or apply insecticides with pyrethrum as the active ingredient. Pyrethrum breaks down quickly and has little residual effect. Organic chemicals that are highly effective in managing stink bugs and most beetles are not known to exist. Applications of pyrethrums may result in management that is short term and limited.

## *Home Garden Series*

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