



VEGETABLE INSECTS

Flea Beetles

Flea beetles are tiny, black, jumping insects that chew small, round holes in the leaves of young tomatoes, eggplant, potatoes and related plants, as well as spinach, beets, radishes, turnips and cole crops. There are several kinds of flea beetles; some are general feeders and some prefer specific types of plants. Beetles feed most in the spring and early summer, and generally cause little real damage to the plants. Eggplant is one exception to this rule. This crop can be protected by covering seedlings with row covers until they have a chance to establish. Keep insect populations down by controlling weeds in the garden and cultivating the top inch or so of garden soil. Try interplanting vegetables so it is more difficult for the insects to find their favorite plants. Cleaning up garden debris before winter is also helpful, as adults lay eggs in the top layer of soil, and they find protection under the debris. Sevin is also effective, but unnecessary.

Colorado Potato Beetles

These beetles prefer plants in the Solanaceae family--potatoes, eggplant, peppers and tomatoes--although they will also attack cabbage and petunias. They are about 3/8" long, with black and creamy yellow stripes. Their larvae are fat and orange-red, with two rows of black dots and a black head and legs. Both adults and larvae are voracious feeders, sometimes defoliating plants. They usually appear in late May and June in the Chicago area.

Rotating different crops gives some control. Try also mulching with a thick layer of straw: this prevents beetle larvae from climbing up onto plants. Encourage predators such as ground beetles, paper wasps and toads. Try wetting down plants and then sprinkling them with wheat bran. The bran swells up inside the hungry insects and causes them to explode.

Handpicking can be an effective control if done when the beetles and their larvae are first detected. Be sure to wear gloves, though, as these beetles can pinch. If chemical control becomes necessary, a special strain of Bt, *Bacillus thuringiensis san diego* or *tenebrionis* is effective. Carbaryl (Sevin), permethrin and rotenone are also effective.

Mexican Bean Beetles

These beetles favor beans, but will also attack plants in the cabbage family. Mexican bean beetles are related to and resemble lady beetles. Adults are about 1/4" long and wide. They are yellow when young and they mature to a coppery orange. Wings have sixteen black spots, but they have no white markings between their heads and their bodies, distinguishing them from the helpful, predator lady beetles. The beetles emerge in spring and lay their eggs on the underside of leaves. All stages of this insect feed on the underside of foliage and skeletonize leaves.

Controls include cleaning up garden debris to eliminate places for the beetles to spend the winter and interplanting susceptible crops with other vegetable crops. Handpicking can also be effective if done on a regular basis, and row covers work well to exclude the insects. Use chemical control only if necessary: harvest will not be affected unless 20% or more of the foliage is eaten. Carbaryl (Sevin) and rotenone are the recommended treatments.

Cucumber Beetles

The two most commonly seen cucumber beetles are the striped cucumber beetle and the spotted cucumber beetle.

The striped cucumber beetle is about 1/4" long. It is bright yellow with a black head and three black stripes running down the length of its wings. Its larvae are white and worm-like. In addition to feeding on cucumbers, this insect will attack squash, melon, pumpkins, beans, peas, corn, beets, eggplant, tomatoes, potatoes, as well as a number of garden flowers, trees and shrubs.

The spotted cucumber beetle resembles its striped cousin, but it is greenish yellow and bears eleven large black spots on its wings. The worm-like larvae of this beetle is beige with a brown head, about 1/2" long, and is commonly known as the corn rootworm. This beetle attacks corn, cucumbers, squash, melon, pumpkins, tomatoes, eggplant, potatoes, and some types of fruit.

Both of these beetles chew holes through foliage and flowers, and sometimes fruit. Corn plants that have been infested with these pests will often fall over. Both beetles transmit bacterial wilt and cucumber mosaic virus, incurable diseases of cucumbers.

Crop rotation is one control, but in order for this to work, the alternate crop must remain in place for two or more years. Non-bitter varieties of cucumbers are less attractive to the beetles; planting them can limit populations. Heavy mulching is a good deterrent for the larvae of the

striped cucumber beetle. Crop covers put in place before plants start flowering will help to keep adult beetles off plants. Check under covers regularly, though, because larvae may get trapped there. Trapping beetles is another option. Try baiting an overturned paper milk carton with bitter melon.

If chemical treatment is necessary, apply Carbaryl (Sevin) or rotenone when the beetles are first noticed in spring. If blossoming has begun, spray late in the day so as not to harm pollinating insects. Corn should be sprayed every two to three days with carbaryl when beetles are present and eating the silks. Stop when the silks turn brown.

Asparagus Beetles

Asparagus beetles are tiny orange and black insects, about ¼" long. Adults appear in spring, feed on young asparagus shoots, and lay their eggs. In a few weeks the eggs hatch, and the larvae feed for a time before moving beneath the soil, where they pupate into adults. Several generations are produced each season, and populations can build up quickly.

Handpicking can be difficult because the beetles are tiny and fast. Try doing it in the early morning while it is still cool. If infestations become heavy, control them with pyrethrin or rotenone, and cut asparagus foliage down to the ground as soon as it begins to die back. Let the birds clean up the remaining beetles before applying mulch to the area.

Cabbageworms and Cabbage Loopers

Both of these pests are moth larvae that feed on cabbage and related plants, as well as lettuce and nasturtiums, peas, beans, tomatoes, spinach, celery, parsley, potatoes and carnations.

The cabbageworm is pale green with a yellow stripe down its back, and it has tiny feet along its body. Adult moths are white with black wing tips, yellowish undersides and black spots.

The cabbage looper is an inchworm with no legs in the middle of its body. It grows to about 1 1/2 inches long and is green with white stripes on its back and sides. The adult cabbage looper is a brown moth with silver markings.

These caterpillars are very difficult to see, especially on green varieties or those with curly leaves. Look for holes and for their dark green droppings around the margins of leaves. Both caterpillars chew holes in the leaves when young, and head for the center of the cabbage heads to feed as they mature. For this reason, cabbage varieties with a tight head are somewhat more resistant to damage.

Some control can be gained by keeping the garden area clean and free of weeds. Early planting can sometimes be helpful because it lets the plants have a head start before the caterpillars are present. Handpicking is effective if done regularly. Be sure to check both sides of the leaves and look for eggs, too. Cabbage loopers' eggs are greenish white and cabbageworms' eggs are yellow. Crop covers can be helpful, but they must be checked to be sure that the larvae are not emerging from underneath them. Recommended chemical treatment for these pests is *Bacillus thuringiensis kurstaki* (Dipel, Safer Caterpillar Killer) or permethrin.

Cutworms

Cutworms are the larvae of a large brown moth. They are night feeders, unlikely to be seen in the garden during the day. These dark, 1 to 1 1/2" long, fat caterpillars damage many garden crops by chewing them off, right at soil level. Young transplants are particularly vulnerable.

Control cutworms by placing a collar around young plants. The collar can be fashioned of plastic, metal or cardboard, or simply use a paper cup with the bottom cut out. Large nails, toothpicks or twigs placed in the ground next to the stems of young transplants will also help to deter cutworms, or try wrapping the stems with aluminum foil. Handpicking can be effective, but must be done at night when the cutworms are active.

Effective sprays, if necessary, are carbaryl or rotenone. Apply to the base of the stems.

Tomato Fruitworm (Corn Earworm, Cotton Bollworm)

The tomato fruitworm is known by several names because it is not very fussy about what it eats. Although its favorite food is corn, it will also devour tomatoes, tobacco, cotton, peppers, eggplant, okra, potatoes, peas and beans. The caterpillar is 2" long and varies in color from green to light yellow to brown, with sidewalls that may be light or dark. Adults are large, fat-bodied grayish brown or tan moths with black-spotted wings. In our area, adult moths migrate for the winter, but return when the weather warms to lay their eggs on host plants. Several generations hatch in one year.

These caterpillars chew holes through the stem ends of tomatoes, and a fruitworm may choose to eat just one fruit, or it may move on to sample many. They chew on corn silks, interfering with pollination, and later they work their way into husks, deforming the ears and opening them up to diseases. Damage on peppers will be evident as pinhead size holes. On other crops, they eat the newest leaves and buds.

Adult moths fly at night or at dusk, and they are attracted to light. A light trap can be used to detect their presence. Larvae tend to hatch about two weeks after the full moon. If they can be detected before they enter the fruit, they are much easier to control.

If fruitworms are discovered, remove and destroy any infected fruit immediately. Handpicking is often an effective control, as in this area fruitworms are not usually present in great enough numbers to cause significant damage. Tomato fruitworms have many enemies, including parasitic wasps and flies, soldier beetles, lacewings, many birds and even moles. Bats will eat the adult moths.

If sprays become necessary, carbaryl is recommended. Spray three to four times at five to ten day intervals.

Squash Vine Borer

This pest attacks summer and winter squash, pumpkin, melons, and cucumbers. The squash vine borer is the caterpillar of a red and black clearwing moth that looks rather like a large hornet. The borer itself is a wrinkled white caterpillar with a brown head, and it grows to about an inch in length.

Reddish-brown eggs are laid on the stem close to the soil line in early to mid summer. When the eggs hatch, the larva bores its way into the stem and begins feeding. Often the first sign of squash vine borers is the sudden wilting of the vine. On closer inspection, a hole may be found at the base of the stem, surrounded by a green, sawdust-like material called frass. This is where the borer entered the stem.

Prevent borers from laying eggs by keeping plants covered with row covers until they flower. Plant early or late crops to avoid peak egg-laying season. Plant butternut squash, which is resistant to the borers.

Remove stem borers by slitting the stems with a razor blade. Inspect stems carefully; there may be more than one borer per stem. After the borer is removed, cover the damaged area with soil so that the plant can initiate new roots. Because they more easily develop new roots, vining varieties are easier to save than bush types.

If chemical control is desired, *Bacillus thuringiensis* can be inserted into the borer's hole, or weekly applications of carbaryl (Sevin) can be made to the crowns and runners when the plants start to vine. This should be done late in the day.

Squash Bugs

Also known as “ stinkbug,” this pest’ s preferred foods are squash, pumpkins, melons and cucumbers. Adult squash bugs are dark brown, about 1/2” long, with flat backs and long leg and antennae. Immature nymphs are pale green with a reddish head and legs. Eggs start out shiny gold and eventually change to reddish brown. They are laid on the undersides of leaves.

Both adults and nymphs pierce plant tissue and suck out sap, and they can easily kill young plants. Leaves of older plants will wilt, blacken and eventually die.

Control squash bugs by cleaning up old crop residue, weeds, woodpiles, etc., as adults spend the winter under this type of cover. Rotate vine crops to a different location year to year, and start plants inside so they will be less vulnerable to attack. Place crop covers or screening over young plants to help them to establish. Handpick eggs and crush them. Place a board out in the garden, and crush any insects that have taken refuge there.

Root Maggots

There are a number of different species of root maggots, and they may attack onions, cabbage, broccoli, cauliflower, Brussels sprouts, turnips, radishes and rutabagas. Adults of these pests look similar to houseflies, and the larvae are small, fat, white grubs. These larvae burrow down into the stems of plants and begin feeding on the roots. Seedlings are particularly vulnerable.

In cabbage and its relatives, young seedlings may suddenly turn yellow, wilt and die. Uproot the plants to find the maggots clinging to the roots, or the remains of the roots. Root crops such as radishes and onions may also wilt somewhat, but the greatest damage is underground. The maggots leave scars and tunnels that often render the vegetable inedible.

To prevent infestation, start seedlings inside or under cover. Cover vulnerable plants with row covers. Give plants in the cabbage family an early start. Cover the soil around susceptible plants with screening or spread diatomaceous earth or wood ashes around the base of seedlings. Rotate crops every year and remove and destroy all cabbage family crops at the end of the season. Rototill garden soil immediately after harvest. Interplant crops to slow the spread of these pests within the garden. Plant red cabbage varieties as they are more resistant to this insect.