

Cucumber, Squash, Melon & Other Cucurbit Insect Pests

Cucumber Beetles

The spotted, striped and banded cucumber beetles are very harmful to cucurbits (members of the gourd family, including cucumbers, melons, pumpkins and squashes), particularly young plants. Beetles commence feeding on plants as soon as they emerge and either kill the plants or greatly slow growth. In cucurbit plantings throughout South Carolina, beetles have been observed entering the soil through cracks and feeding on seedlings below the soil surface. Beetles are present throughout the growing season and feed on all parts of the plant including the flowers and fruit.

Cucumber beetles also transmit bacterial wilt of cucurbits. This disease overwinters (survives the winter) in the intestines of the beetles and is scattered from plant to plant as the beetles feed. Infected plants eventually wilt and die. Many new varieties of cucurbits have resistance to bacterial wilt. Cucumber beetle larvae (immature forms) feed on the roots and bore into both roots and stems of cucumber plants.



Spotted cucumber beetle adult (*Diabrotica undecimpunctata howardi*) J.P. Michaud, Kansas State University, www.insectimages.org

The yellowish-green adult spotted cucumber beetle (*Diabrotica undecimpunctata howardi*) has 11 black spots and a black head with black antennae. The yellowish-white larvae have brown heads and are $\frac{3}{4}$ inch (19 mm) long when grown.



Striped cucumber beetle (*Acalymma vittatum*) Clemson University - USDA Cooperative Extension Slide Series, www.insectimages.org

The yellow adult striped cucumber beetle (*Acalymma vittatum*) is about $\frac{1}{5}$ inch (5 mm) long with three longitudinal black stripes on the top wings. The whitish larvae are about $\frac{1}{3}$ inch (8.5 mm) when grown.

The adult banded cucumber beetle (*Diabrotica balteata*) is yellowish green with three bright green stripes or bands running across the wing covers. In a home vegetable garden, control measures include the use of fabric row covers, such as spun-bonded polyester. These covers provide an effective barrier between the insect and young plants. Remember to remove the covers during flowering to ensure pollination. Handpicking to remove the beetles is time-consuming but effective. In addition, several

predators and parasites are enemies of cucumber beetles. Eliminate weeds in and around the garden.



Banded cucumber beetle (*Diabrotica balteata*) Ottens, University of Georgia, www.insectimages.org

Spider Mites

Two-spotted spider mites (*Tetranychus urticae*) can be a serious problem on cucurbits, especially watermelons and cantaloupes, during hot, dry weather. These tiny mites feed on the contents of individual cells of the leaves. This damage appears as pale yellow and reddish-brown spots ranging in size from small specks to large areas on the upper sides of leaves. Damage can develop very quickly and the mites can kill or seriously stunt the growth of plants. Because of their small size, spider mites are hard to detect until vines are damaged with hundreds of mites on each leaf. Certain insecticides applied at planting or as a foliar spray for insect control apparently contribute to severe outbreaks of mites on melons by killing their natural enemies.



Typical stippling damage to leaves from two-spotted spider mites. Whitney Cranshaw, Colorado State University, www.insectimages.org



Extreme close-up of two-spotted spider mite David Cappaert, Michigan State University, www.insectimages.org

Insecticidal soaps generally offer adequate control when applied before the numbers are too high. Make two applications five days apart. Squash leaves are easily burned by insecticidal soaps, so use the most dilute concentration recommended, and use sparingly. Do not spray plants in direct sun or if plants are drought stressed. Spider mites can also be controlled with neem extract. Mites can be removed with a strong spray of water. Predatory mites and beneficial insects such as lady beetles and minute pirate bugs are important natural controls.

Melon Aphids

Melon aphids (*Aphis gossypii*) and several other aphid species attack cucurbits, particularly melons and cucumbers. Melon aphids vary in size and color from light yellow to green to black. Some are winged, while others are wingless.



Melon aphids, also known as cotton aphids Mississippi State University Archive, Mississippi State University, www.insectimages.org

They are found chiefly on the underside of the leaves, where they suck the sap from the plants and cause a reduction in the quality and quantity of the fruit. Infested leaves curl downward and may turn brown and die. The melon aphid also is one of the chief agents in transmitting *Cucumber mosaic virus*. Usually, cucurbits are not attacked by aphids until the vines form runners.

Consider natural controls when making treatment decisions. Beneficial insects are extremely important in keeping aphid populations in check. Infestations usually are higher in hot, dry summers following cool, dry springs, which have reduced the efficiency of the natural enemies. In addition to natural enemies, you can spray leaves with soapy water, then rinse with clear water. Spraying with insecticidal soaps (such as Safer Brand Soap), planting in aluminum foil-covered beds and filling yellow pans with water to trap the aphids are also effective control measures.

Squash Bugs

The squash bug (*Anasa tristis*) is one of the most common and troublesome pests in the home vegetable garden. Squash plants frequently are killed by this sap-feeding pest. Leaves of plants attacked by the bugs may wilt rapidly and become brittle. Winter varieties of squash, such as Hubbard and Marrows, are much more severely damaged by the squash bug than other varieties. Control is required to protect squash in the home garden.



Older squash bug nymphs Whitney Cranshaw, Colorado State University, www.insectimages.org

The adult squash bug is rather large, brownish black, and flat-backed. It is about $\frac{5}{8}$ inch (1.6 cm) long and approximately $\frac{1}{3}$ as wide. The young, called nymphs, are whitish to greenish gray, with

black legs. They vary in size from tiny, spider-like individuals when first hatched, to maturing nymphs, which are nearly as large as the winged adults.



Squash bug egg clusters Whitney Cranshaw, Colorado State University, www.insectimages.org

Squash bugs overwinter in protected places as unmated adults. They appear rather slowly in the spring. They mate and begin laying egg clusters about the time vines begin to grow and spread. Eggs are yellowish brown to brick red in color and are laid in clusters of a dozen or more on the leaves. They hatch in about 10 days into nymphs that become adults in four to six weeks. Only one generation of bugs develops each year. New adults do not mate until the following spring.

The squash bug is secretive in its habits. Adults and nymphs may be found clustered about the crown of the plant, beneath damaged leaves, and under clods or any other protective ground cover. They scamper for cover when disturbed. The secretive nature of squash bugs can be used to your advantage in controlling these pests. Place a small, square piece of old shingle or heavy cardboard under each squash plant. As bugs congregate under it for protection, simply lift the trap and smash them with your hoe (or shoe). Other control methods include early planting and removing eggs and nymphs by hand.

Remove and destroy vines and discarded fruit after harvest to eliminate overwintering sites. Early detection of squash bugs is very important, as they are difficult to control and can cause considerable damage. Apply insecticides when nymphs are small, as adults are difficult to kill.

Squash Vine Borers

The squash vine borer (*Melittia cucurbitae*) ranges from Canada to Argentina and is the most serious enemy of squashes and gourds. It causes much trouble where only a few plants are grown in gardens. It rarely attacks cucumbers and melons. Great variations exist in the susceptibility of squash and pumpkin varieties. Butternut and Green-Striped Cushaw varieties are practically immune to attack, but Hubbard squash is highly susceptible.



Squash vine borer larva and damage Alton N. Sparks, Jr., University of Georgia, www.insectimages.org

Damage is caused by larvae (immature forms) tunneling into stems. This tunneling often kills plants, especially when the larvae feed in the basal portions of vines. Sometimes fruits are also attacked. Sudden wilting of a vine and sawdust-like insect waste coming from holes in the stem are evidence of attack.



Close-up of squash vine borer larva Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org

The adult is one of the moths known as “clear wings” because the hind wings are almost without scales. It is 1½ inches (3.8 cm) in wing expanse and metallic greenish black in color. Hind legs are fringed with black and orange hairs, and markings of similar color occur over much of the abdomen. The moths are day fliers and are often mistaken for wasps. Larvae are white, heavy-bodied and considerably over 1 inch (2.54 cm) long when fully grown.

The insect overwinters in the soil as a larva or pupa (a nonfeeding stage where the larva changes to an adult) enclosed in a cocoon. Moths emerge in early summer and lay eggs on the stems of the plants, usually late May in the South. Upon hatching, larvae bore into vines and complete their development in four or more weeks. Then they leave the plant, crawl into the soil, spin a cocoon and transform to a pupa. There are two generations in South Carolina.

In a vegetable garden, various measures can be taken to control this pest. Till the soil in late winter to expose overwintering insects. Rotate squash to another location in the garden each season. Destroy vines that have been killed to break the life cycle. You can slit the infested vine lengthwise and remove borers or kill them with a long pin or needle. Place soil over slit stem after removing the borer to encourage root development, and keep plants well watered.. Plant as early as the weather allows since borers do not emerge until early summer.

Pickleworms

The pickleworm (*Diaphania nitidalis*) severely damages cucumbers, cantaloupes, summer squash and pumpkins. It also feeds on other cucurbits, such as winter squash, and watermelons, but usually does little damage.

Pickleworm damage occurs when the caterpillars tunnel in flowers, buds, stems and fruits. They prefer the fruits. Frass (sawdust-like insect waste) often protrudes from small holes in damaged fruits. At times, damaged fruits cannot be recognized until they are cut open. Damaged fruits are not edible. Flowers, buds and sometimes entire plants may be killed.

In South Carolina, pickleworms starve or freeze to death during the winter. They overwinter in Florida and spread northward each spring. Severe damage usually does not occur before summer in South Carolina. Heavy populations generally do not build up before the first flower buds open; however, late crops may be destroyed before blossoming. The pickleworm has complete metamorphosis, passing through four distinct stages (egg, larva, pupa and adult) during development.

Eggs are yellow, irregularly shaped and resemble grains of sand. They are laid singularly or in small groups on leaves and hatch in three to four days.



Pickleworm larvae inside fruit Clemson University - USDA Cooperative Extension Slide Series, www.insectimages.org

Larvae feed first on buds, blossoms and tender terminals, but soon move to the fruits. These brown-headed caterpillars molt (shed their skin) four times before they become about $\frac{3}{4}$ inch (1.9 cm) long and fully grown in nine to 28 days. The body is yellowish white at first, but many reddish-brown spots appear on the back after the first molt. After the last molt, the caterpillar loses its spots and becomes solid green or copper. Finally, the caterpillar stops feeding, becomes pink to pale green and spins a thin silk cocoon around itself, usually within a folded-over portion of a leaf where it pupates (becomes a pupa).

Pupae (nonfeeding stage where the larva changes to an adult) are light to dark brown and slightly more than $\frac{3}{4}$ inch long. Pupae are usually found in a rolled leaf. However, they have been found inside cantaloupe and summer squash in rare instances. Adults usually emerge after seven to 10 days.

Adults are brownish-yellow moths that have a rounded brush of hairs at the rear of the body. The brownish-yellow wings have a purplish sheen, translucent yellow-white centers and a spread of about 1 inch (2.54 cm). Moths are active at night.

Select early maturing varieties and plant as early as possible before pickleworm population peaks. Destroy damaged fruit and crush rolled sections of leaves to kill pupae. The more resistant varieties are: Bitternut 23, Summer Crookneck, Early Prolific Straightneck, and Early Yellow Summer Crookneck.

Squash Beetles

The squash beetle (*Epilachna borealis*) is one of two species of Coccinellidae known to occur in the United States that eat plant material rather than other insects. The squash beetle feeds upon the leaves of cucurbits. The other species, the Mexican bean beetle (*Epilachna varivestis*), a close relative of the squash beetle, is a serious bean pest.

The adult of the squash beetle overwinters in crop debris. All other lady beetles are beneficial because they feed on insect pests such as aphids and scale insects.



Adult squash beetle, with spiny larva at left Clemson University - USDA Cooperative Extension Slide Series, www.insectimages.org

Destroy crop residues after harvest and reduce overwintering sites by tilling.

Control of Curcubit Insects

Cucumber beetles or squash beetles can be controlled effectively using carbaryl (Sevin), but wait one day after spraying before harvest. For

aphids or spider mites use an insecticidal soap such as Concern Insect Killing Soap or Safer Brand Soap. Control heavy populations of aphids or spider mites with neem oil extract (such as Green Light Neem Concentrate or Bonide Bon-Neem).

For vine borers and pickleworms control after mid-June, apply carbaryl (Sevin) or neem oil extract weekly, and spray or dust in the evening to not kill pollinating insects. Wait one day after spraying carbaryl before harvest. Rotenone (such as Hi-Yield Rotenone Dust) is effective against younger squash bugs, but not against the adults. Esfenvalerate (such as Ortho Bug-B-Gon MAX Garden & Landscape Insect Killer RTU) or permethrin (such as Bonide Eight Insect Control Vegetable, Fruit & Flower Concentrate) or bifenthrin (such as Ortho Bug-B-

Gon MAX Lawn & Garden Insect Killer Concentrate) will control cucumber beetles, squash bugs, squash vine borers and pickleworms, but wait 3 days after spraying before harvest.

Prepared by Randall P. Griffin, Extension Entomologist, Clemson University. Revised by Joey Williamson, HGIC Horticulture Extension Agent. (New 03/99. Revised. 09/07. Images added 05/09.)

This information is supplied with the understanding that no discrimination is intended and no endorsement by the Clemson University Cooperative Extension Service is implied. All recommendations are for South Carolina conditions and may not apply to other areas. Use pesticides only according to the directions on the label. All recommendations for pesticide use are for South Carolina only and were legal at the time of publication, but the status of registration and use patterns are subject to change by action of state and federal regulatory agencies. Follow all directions, precautions and restrictions that are listed.