

Squash Vine Borer

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Damage

Attack by squash vine borer is characterized by a sudden wilt of the plant. Larvae bore within stems, usually in the lower 30 cm (one foot) of the stem. When gourds are grown on a trellis, borers can be found at any stem node, even several feet above ground. Stems can be girdled by borers, which prevents water and nutrients from circulating in the plant. The point where a borer enters a stem is marked by a hole with yellow granular or sawdust-like frass exuding from it. Injured vines often decay and become wet and shiny. Infested plants can be weakened or they can die; the ultimate effect on the plant depends on the number of borers and their location. Over 100 larvae have been found in a single vining plant in plants with multiple stems, but one larva per plant is most common.

If a plant wilts but there is no evidence of borers, other possible causes are a bacterial wilt infection, yellow vine disease, or root feeding by larval cucumber beetles.

Hosts

Squash, zucchini, pumpkins, and gourds are attacked. The borer prefers Hubbard squash over other hosts. Butternut squash is less susceptible than other squashes. Cucumbers and melons are usually not attacked.

Classification

The scientific name of the squash vine borer is *Melittia cucurbitae* (Harris). It is a member of Order Lepidoptera, Family Sesiidae.

Appearance

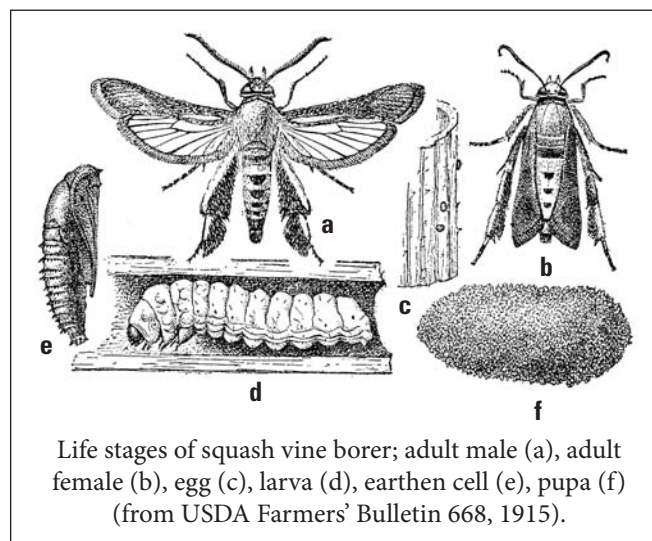
Eggs are oval, flattened, dull-red in color, and 1 mm (1/25 inch) in diameter. The larva is a fat grub-like caterpillar with a white, wrinkled body and a brown head. A fully grown larva is 25 mm (1 inch) long. The pupa is brown and 16 mm

(5/8 inch) long, and contained inside a cocoon that is made of earth-covered black silk and is 19 mm (3/4 inch) long.

The adult is a moth that looks somewhat like a wasp; the body is black, marked with orangish red, and the hind legs are feathery with black and orange hairs. The front wings are metallic green, and the hind wings are transparent; the wingspan is 25 to 37 mm (1 to 1.5 inch). Male and female moths are similar, although the male is more colorful, smaller, has a narrower abdomen, and more feathery antennae.

Life Cycle and Behavior

The squash vine borer overwinters as a fully grown larva in a cocoon in the soil, 2 to 15 cm (1 to 6 inches) deep. It pupates in the spring and the adult, a moth, emerges in June. Squash vine borer moths are active during the daytime and in the evening they rest on leaves. This is different than the behavior of most moth species, which are active at night. The squash vine borer moths fly slowly in zig-zags around plants,



and lay eggs singly on stems. Eggs are usually found on the main stem near the base, but are also found on leafstalks or on the undersides of leaves. Moths are active for about two months, with a peak in about early July.

Eggs hatch in 9 to 14 days. Larvae enter the stem at the plant base within a few hours after the eggs hatch. Larvae feed inside the stem for 4 to 6 weeks. Fully grown larvae leave the stems and crawl into the soil to pupate. There is usually one generation per year in Ohio. A partial second generation is possible but has not been documented.

A trap baited with the squash vine borer's sex pheromone is a useful tool in determining when the moths are active. This pheromone is commercially available from Great Lakes IPM, Inc. The most effective trap type for monitoring squash vine borer is a large cone-shaped net trap such as the Scentry Heliothis trap, but a bucket trap or a sticky delta trap can also be used. The trap should be placed just above the crop canopy. Traps are much less effective if higher above the canopy.

Natural Enemies

The stage most susceptible to natural enemies is the egg stage, which is attacked by parasitic wasps. Larval and adult ground beetles can attack larvae of squash vine borer, but do not appear to cause significant mortality.

Cultural Control

- Destroy vines soon after harvest to destroy any larvae still inside stems.
- Till or disk the soil in fall or spring to destroy overwintering cocoons.
- Cover vines at leaf joints with moist soil to promote formation of secondary roots that will support the plant if the main root and stem are injured.
- A trap crop of very early-planted Hubbard squash can be used to alleviate pest pressure on other cucurbits.

Mechanical Control

The following are suitable in small plantings:

- Crush the eggs by hand before they hatch.
- Stems can be covered with a barrier, such as strips of nylon stockings, to prevent egg laying.
- Borers can be removed from vines if detected before much damage is done. Examine stems in early summer; once holes are detected, slit the stem longitudinally with a fine, sharp knife, remove the borer, then cover the wounded stem with moist soil above the point of injury to promote additional root formation.
- Catch and destroy the moths, especially at twilight or in early morning when they are resting on the upper side of leaf bases.

Chemical Control

Squash vine borer can be killed by chemicals but the key is in the timing of the application. An insecticide is effective when applied at the time that eggs are hatching. A preventive treatment regime is to apply an insecticide within one week after the adults are detected in pheromone traps; this is usually in late June around the time when vines begin to run. Insecticide should be re-applied every 7 to 10 days for 2 to 5 weeks. The application should be directed to the base of plants, at crowns, and runners.

Chemicals used for borer control in gardens are pyrethrins, pyrethroids (bifenthrin, esfenvalerate, permethrin), carbaryl, or malathion, applied as sprays or dusts. The biological insecticide B.t. (Dipel), in the forms currently available, is not effective because it cannot be easily applied to the plant parts that are eaten by the borer.

Insecticides used for borer control on commercial farms include endosulfan (Thionex), which is not restricted-use, and pyrethroids (Asana, Pounce, Baythroid, Mustang, or Warrior), which are restricted-use.

This publication may contain pesticide recommendations that are subject to change at any time. These recommendations are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. Due to constantly changing labels and product registrations, some of the recommendations given in this writing may no longer be legal by the time you read them. If any information in these recommendations disagrees with the label, the recommendation must be disregarded. No endorsement is intended for products mentioned, nor is criticism meant for products not mentioned. The author, The Ohio State University, and Ohio State University Extension assume no liability resulting from the use of these recommendations.

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