

Squash Vine Borer

The squash vine borer (*Melittia cucurbitae*) feeds on a number of cucurbit plants including squash, pumpkin, cucumber, and muskmelon. Susceptibility to damage varies depending on the variety. Hubbard squash, for example, is extremely vulnerable to attack by squash vine borer.



Figure 1. Adult.

Life History

The squash vine borer adult is a clear-winged moth $\frac{5}{8}$ inches long (Figure 1) with a wingspan of 1 to 1½ inches. Front wings are covered with scales. Hind wings do not have scales but are transparent with red-brown hairs along the edges. The adult body is orange-red with gray bands and three black markings and orange-red hairs on the abdomen.

Moths appear when crop vines are present. Daytime activity continues for up to 45 days. Females deposit eggs on the stem near the soil level or on stems or petioles when plants begin to flower. Red-brown, flattened eggs are about $\frac{1}{30}$ inches in diameter and typically located at the base of plants (Figure 2). Each female is capable of producing up to 200 eggs. Larvae hatch from eggs in 7 to 10 days and are white with dark head capsules. Young larvae are $\frac{1}{4}$ to $\frac{3}{4}$ inches long, with bodies tapering toward the end of the abdomen. Fully developed, mature larvae are 1 to 1½ inches long and somewhat wrinkled in appearance (Figure 3).



Figure 2. Eggs at the base of plant.



Figure 3. Squash vine borer larva.



Figure 4. Several squash vine borer larvae in stem.

After emerging from the eggs, larvae immediately tunnel into the base of plants and spend up to 30 days feeding extensively inside plant stems. Although there is generally one larva per stem, multiple larvae may be present in a single tunnel in the stem (Figure 4). Mature larvae exit plants and burrow into the soil to pupate, constructing brown, silken cocoons in which to overwinter. The squash vine borer overwinters as a mature larva in a cocoon located 1 to 2 inches beneath the surface of the soil. The adult (moth) emerges in early spring. Squash vine borer has one generation per year in Kansas.

Damage

Squash vine borer larvae feed within the internal vascular tissues of plants, inhibiting their ability to take up water and nutrients. Damage symptoms include sudden wilting of vines (Figure 5),



Figure 5. Plant wilting due to squash vine borer larval feeding.

plant collapse (Figure 6), and eventual death. Once larvae enter the plant, not much can be done to prevent damage. The tunnels inside infested plants are packed with moistened frass (fecal matter). Yellow-green sawdust-like frass found around feeding sites at the base of vines or plants (Figure 7) indicates that larvae have entered the plant.



Figure 6. Plant collapse due to squash vine borer larval feeding.



Figure 7. Yellow-green frass at the base of plant.

Management

Squash vine borer management involves implementing a number of plant protection (prevention) strategies, which include sanitation, physical control, use of trap plants, and insecticide applications.

Sanitation

Remove and dispose of all wilted plants before the larvae leave and enter the soil. Discard all plant debris such as vines and fruits after harvest.

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Physical Control

Rototilling in fall or spring kills squash vine borer pupae directly or brings them to the soil surface where they die from exposure to cold weather or predation by birds. In addition, plowing buries pupae deep in the soil, which inhibits adult emergence. Another management technique, of limited use in large plantings but feasible in smaller ones, is to locate infested stems and vines, slit the base of the plant, and use tweezers to remove and destroy the larvae inside. The plant base should then be covered with moist soil to stimulate growth of secondary vines and roots in order to help the plant reestablish.

Trap Plants

Early plantings of summer squash can serve as a trap plant for squash vine borer. Encouraging female moths to deposit eggs on the trap plants, protects later plantings of summer squash, winter squash, and pumpkins from exposure to squash vine borers. Trap plants should be removed and discarded or sprayed with an insecticide when eggs are present.

Insecticides

Insecticides should be applied when adults are active or after larvae hatch from eggs but before they tunnel into plants. Timing of the application is critical to ensure effective suppression of squash vine borer populations. Pheromone traps for squash vine borer adults can be placed near plants to detect peak moth activity and help time insecticide applications for maximum effectiveness. It is important to obtain thorough coverage of all plant parts, especially the base where larvae enter. At least two applications 5 to 7 days apart are required to kill a sufficient number of larvae before they enter plants, with additional applications needed throughout the growing season.

Thorough spray coverage becomes more difficult as plants develop a dense leaf canopy but can be accomplished with a multidirectional, high-pressure nozzle. Apply insecticides in the early morning or late evening so residues persist longer on plant parts. Exercise caution when applying insecticides to avoid harming honey bees, bumble bees, and other pollinators or natural enemies regulating populations of other insect or mite pests. Apply insecticides in the early morning or late evening when pollinators are less active.

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