

A Gardener's Guide to Squash Vine Borer

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Fast Facts

- The squash vine borer is a day flying moth, grey in color with red hind legs and green/silver/clear wings (Figure 1).
- The caterpillar is the damaging stage and it lives/develops inside in the lower portion of squash stems, eating the plant from the inside out. The first symptom of a squash vine borer infestation is wilting and orange frass (fecal material) exuding from the base of the plant (Figure 2).
- Insecticidal control requires sprays or powders be applied to the stem before the borer enters the stem. This means products like neem, spinosad, Sevin®, permethrin, and bifenthrin must be applied just before the eggs hatch.
- If this application window is missed, you can perform vine surgery to remove the caterpillar and maybe save the plant.



Figure 1: An adult squash vine borer



Figure 2: Squash vine borer caterpillars inside of a stem

Biology & Symptoms

The squash vine borer is the bane of a many a gardener's summer. If you grow squash, zucchini, pumpkin, or gourd plants it is likely that you have encountered this caterpillar pest. As a clearwing borer moth the squash vine borer is a wasp mimic, meaning they are day-time fliers and have tapered tips to their abdomens.

The vine borer overwinters as a cocoon in the ground or under leaf litter. In late June or early July adults emerge and begin flying and mating. After mating, females lay eggs individually at the base of squash, zucchini, and pumpkin plants. One week later, eggs hatch and small caterpillars bore into the plant's stem to feed. The caterpillar will feed for a month to a month and a half before exiting to pupate in the ground. There is only one generation of squash vine borers a year.

As the caterpillar feeds inside of the plant it hollows out the base of the stem depriving the rest of the plant of food and water, causing wilting (Figure 3). Upon closer examination you will find piles of yellow-orange frass exuding from a hole in the stem. If no control measures are taken the plant will continue to wither and the base may even rot.

Figure 3: As the caterpillars feed they deprive the plant of food and water leading to wilting.



Management of Squash Vine Borer

Management of squash vine borer is dependent upon being vigilant for this pest. If you wait until you see the previously mentioned symptoms, it may be too late to save your plants. Since this is an brightly colored day flying moth, it is visible when you are in the garden tending to your plants or weeding. If you want to add an extra level of security, you can trap for the females using yellow sticky traps or plastic, yellow bowls that contain soapy water. Females are looking to lay their eggs (Figure 4) and are attracted to yellow squash blooms. Gardeners can use this behavior to manipulate the moth and know when to apply an insecticide.

When you start to see or trap moths it will be time to make an insecticide application. Sprays and powders will need to be applied to the plant's stem rather than the leaves. Organic pesticides such as neem or spinosad are good for controlling vine borers and will need to be reapplied every three to five days over four to five weeks to protect the plant. Synthetic products like Sevin[®], permethrin, and bifenthrin, also work and should be applied every seven to fourteen days over four to six weeks.

If you miss this application window but are seeing the wilting and sawdust like symptoms mentioned previously it is too late to treat but you may still be able to save the plant through surgery. Gardeners can use a sharp knife to cut a vertical slit in the stem and remove caterpillars by hand. Following removal, the stem should be squished back together and then soil should be mounded over the cut portion to encourage re-rooting.

For long term maintenance and control, row covers and fall sanitation may work the best. Row covers are fabrics you can purchase at most garden stores. Pin the edges to the ground and drape the cover over frames or the plants themselves to provide a cloth force-field around your plants. The row covers should be removed once female flowers appear in order to allow bees to visit for pollination. In the fall you should thoroughly remove plant debris that the borer may overwinter in and you should till the area as well. Planting squash in the same location year after year also encourages squash vine borer infestations, so consider rotating where you plant your squash.



Figure 4: The small brown ovals at the base of the plant's stem are the eggs of the squash vine borer. You can remove these by hand or treat your plants to prevent damage.