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INSECT DIAGNOSTIC LABORATORY
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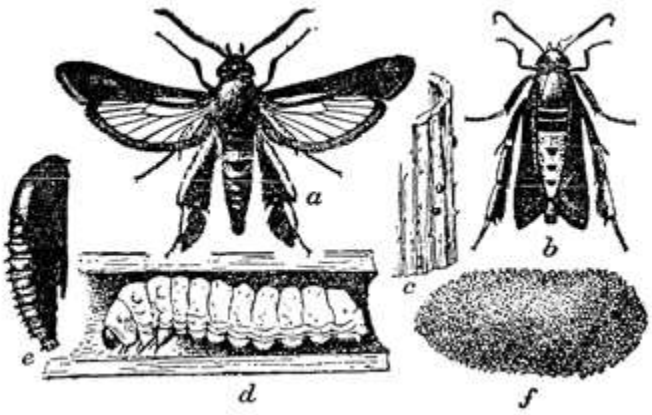
Squash Vine Borer

Melittia cucurbitae (Harris); Family: Sesiidae



Life stages of the Squash Vine Borer

a = male moth (wingspan about 1 inch)
b = female (with wings folded at rest)
c = eggs on a bit of plant stem
d = full-grown larva (about 1 inch long) inside vine
e = pupa
f = pupal cell

Left: Adult (Jim Jasinski, Ohio State University Extension, Bugwood.org; image 5506166)
Right: Larva (Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org; image 1573710)

Injury

The larvae bore into the stems of squashes, pumpkins, gourds, cucumbers and muskmelons. Winter squash (in particular Hubbard), pumpkins, and zucchini are quite susceptible to borer damage. Infested vines at first exhibit wilting, and later may be completely girdled, causing the the leaves and stem beyond the point of attack to rot. This pest often causes damage in home gardens. It has been considered a sporadic pest in commercial plantings of cucurbits, with more damage observed in some years.

The problem often goes undetected until the larvae begin to feed within the vines of squash and pumpkins in July and August. Larval feeding destroys the vascular system, causing the vines to wilt and die. If damage has been seen in the garden in the past, it is possible more problems can be expected.

An infestation may be detected by the presence of coarse, yellowish grains of frass (fecal matter from the feeding larva) that collect at the base of stems or on the ground under the vines. Later the frass becomes moist and shiny, and may be seen oozing from holes in the stems.

Description

The adult of the squash vine borer is a wasp-like moth having a 1 to 1½ inch wingspan, with metallic green forewings, and a reddish abdomen with a line of black dots. The mature larva or caterpillar is a thick, white wrinkled worm with a brown head, and is about 1 inch in length. The eggs are dull red, 1/25th inch in diameter, and are found glued to the leafstalks and stems of squash vines. The pupa is dark brown, 5/8 inch long, and found in an earthen cell in the soil.

Life History

Adult moths emerge from the pupae about the time vine crops come up. In New York State this is usually during the latter part of June. The moths are active daytime flyers, and are often mistaken for wasps. Eggs are laid singly, and glued to stems and leafstalks near the base of the plant. The young borers enter the plant about two weeks later, and begin feeding on the inner tissues. The larvae feed for about one month. If an infected vine is split open, it will be hollowed out and partially filled with frass. Late in the season, borers may be found throughout the plant stem and in the fruits. When fully mature, the larvae leave the stems and make cocoons in the soil. The larvae usually overwinter in the cocoons, changing to pupae the following spring.

Management

Some varieties are known to be resistant to the squash vine borer, such as Waltham butternut. Wherever possible, look for resistant or tolerant varieties if this insect is a problem in your area. The order of preference from most preferred to least is: winter squash (including Hubbard squash), summer squash, pumpkin, gourd, cucumber, and muskmelon.

Lightweight row covers can be used to protect plants until the vines come into flower. Row covers used to prevent insects from reaching the crop must be anchored down on all sides or the moths will crawl under. Remove covers at bloom time to allow for pollination.

Begin scouting the garden in June. Sites heavily infested last year are more likely to have infestations this year. Look for borer eggs near the base of the stem, and remove them before they hatch. Also look for small holes near the stem base, with frass (castings) or ooze coming from the stem. If holes or other damage are seen, cut that area on the stem partly open, lengthwise, to confirm the presence of borer larvae, and destroy and remove any found. Or a sharpened wire may be used to seek out and kill each tunneling larva within the stem. After larvae are killed or removed, press the stem back together and cover with soil. In many cases the plant will heal and survive the injury if damage is not too extensive.

Moist soil heaped over the stem joints will allow new roots to grow along the vine, to help the plant survive even if the main stem base is damaged.

Entomophagous nematodes, of the type used against stem borers (rather than specifically against lawn grubs), are not widely available but can be used to control larvae of the squash vine borer. Inject into the squash plant stem, following directions on the product label.

One insecticide registered for home garden use in New York State for squash vine borer suppression is kaolin clay. It is important to control larvae before they enter the stem, because once they enter the stem, insecticides have little effect. Direct the spray to the stems of the plants near the base. Begin prior to infestation (starting about June 20 for most of New York State) and apply every 5 to 7 days as per label instructions.

To reduce the number of borers for next year, destroy crop residue after harvest, and rotate planting sites.

Prepared 1995 by Carolyn Klass, Senior Extension Associate, Dept. of Entomology, Cornell University; Updated 2012 & 2018