

The Black Vine Weevil

Introduction

A number of weevil species may be encountered in greenhouses, but the black vine weevil (*Otiorhynchus sulcatus*) is the most important weevil species found in greenhouses and perennial nurseries in Connecticut. The black vine weevil has a wide host range, feeding on over 200 plant species. It is often spread by the transport of infected plant material.

Feeding Damage

Adults feed at night and hide around the base of plants during the day. As the adults feed, they cause c-shaped notching along the leaf margin to both herbaceous and woody plants. This damage is primarily cosmetic and may be hard to see on certain plants such as *astilbe* or *taxus*.



Figure 1: Leaf notching at edges of leaves caused by adult black vine weevil. Photos by L. Pundt

The young larvae feed on fine roots and the mature larvae feed on stems, crowns and larger roots. In herbaceous perennials, the larvae often feed in the crown severely reducing root systems and causing plant death.

Some of the perennials prone to damage include *astilbe*, *bergenia*, *epimedium*, *helleborus*, *heuchera*, *heucherella*, *hosta*, *physostegia*, *phlox*, *primula*, *saxifrage*, *sedum* and *tricyrtis*. Some herbaceous perennials are very good hosts, such as *astilbe* or *tricyrtis*, but seem to tolerate more damage than other species. Black vine weevils can also enter greenhouses and may cause damage to some greenhouse crops such as *begonia*, *impatiens*, *gloxinia*, *geranium* and *roses*.



Figure 2: Mature larvae fed upon his Heuchera crown and roots, causing wilting and plant death. Photo by L. Pundt

Biology and Life Cycle

Their life cycle progresses from egg, to larva, pupa and adult. The black vine weevil adult is 3/8 inch long, brown-to-black in color with yellow-brown markings on its wing covers, with ridges extending down the length of the abdomen. Adults have a distinct, short snout and elbowed antennae. Adult black vine weevils cannot fly, because their wing covers are fused together. However, they can crawl through greenhouse openings.

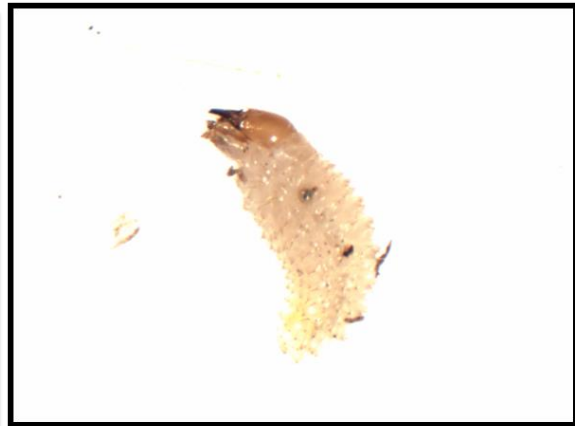


Figure 3: Adult black vine weevil. Photo by R. Cowles and black vine weevil larvae (Photo by L. Pundt)

After approximately two to three weeks of adult feeding, egg laying begins. Outdoors, adult female weevils lay eggs from July through August. Adults can live more than one year, often laying 200 to 400 eggs the first year and over 400 eggs in the second year. Eggs hatch in about two weeks and are laid in the

upper one to two inches of the growing media. All adults are females who do not need to mate to reproduce.

Larvae hatch in August and begin feeding on fine young roots. Larvae are white to cream colored, legless grubs with yellow-brown heads and are covered with fine hairs. The larvae have six instars. When mature, they are about 1/2 inch long. Older larvae are also slightly C-shaped but lack legs. (Scarab beetle larvae have legs). Black vine weevil larvae feed on the roots of host plants and then overwinter as full-grown larvae. Larvae resume feeding in the early spring, often causing the heaviest damage. Pupation occurs in earthen cells that they form in the growing medium.

There is generally one generation per year, but in greenhouses, depending upon temperatures and environmental conditions, several overlapping generations with different life stages may be present.

Scouting

Since the larvae are active in the growing media and adults feed at night by notching the edges of leaves, infestations may go unnoticed until significant damage has occurred. Although adults are active at night, they may be monitored by placing horizontal sticky boards on benches to trap adults. Check plant debris and growing medium around plants for the presence of adult black vine weevils. During the day, adults stay at the base of favored host plants, under and on the side of containers. Adults may be active during cloudy, overcast days.



Figure 4: Adults hiding during the day. Photo by L. Pundt

Larvae feed on roots, causing wilting as roots are damaged. If plants exhibit these symptoms, check the root system and surrounding root ball for the presence of larvae.

Biological Controls

Black vine weevil larvae are susceptible to nearly all commercially available species of entomopathogenic nematodes. Some of the commercially available species include *Heterorhabditis bacteriophora*, *Steinernema kraussei* (Nemasys L) and *Steinernema carpocapsae* that are applied as drenches to the growing medium. Apply the nematodes to moist soil in the early morning or evening to avoid heat and direct sunlight. The nematodes are attracted to, enter and kill all larval stages and pupae, but not eggs or adults.

Heterorhabditis bacteriophora is applied to the soil with a minimum temperature of 57° F. The infected larvae turn brick red to maroon. *Steinernema kraussei* is effective in a wide range of temperatures from 41 to 86° F; infected larvae or pupae turn dark yellow. Consider other *Steinernema* species if soil temperatures exceed 60°F. Infected larvae or pupae remain creamy yellow-white, but you can see nematode movement through the cuticle with a hand lens. These nematodes can be applied from March to May and from August until November to target the larvae after eggs have been laid. The nematodes are active up to 6 weeks after their application. Repeated applications may be needed depending upon the level of infestation. Nematodes should be applied to moist growing media during cloudy, overcast weather.

Cultural Controls

Adults cannot fly but may invade heated structures to overwinter, or may enter outdoor production areas from surrounding vegetation or be accidentally brought in on infested plant material.

- Avoid black vine weevil infestations by buying nursery stock certified as weevil-free.
- Closely inspect incoming plants to exclude weevils from production areas.
- Segregate infested plant material from susceptible new plantings.
- Check older stock material when dividing.
- Handpick adults if only a few plants are infested.
- Immediately discard heavily infested plants.
- Hedgerows of yew, arborvitae or spruce surrounding production areas are good hosts of black vine weevils and may be a source of an infestation.

Chemical Controls

It may be necessary to apply an insecticide drench to protect highly susceptible plants. Drench applications of the insecticide, bifenthrin (Talstar N Granular®) effectively kills black vine weevil larvae in containers and in the growing medium. It is applied as a pre-plant potting mix incorporation based upon the

known bulk density of the media as a preventative treatment. See label for special use instructions. All of the soil volume must be treated.

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