

# 51. Weevils

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*Revised from chapter by William M. Hoffard, 1989.*

## Hosts

Weevils (family Curculionidae) feed on a wide variety of plants. In forest nurseries, seedlings of many species, especially hemlock, spruce, and Douglas-fir, may be severely attacked. The most destructive weevils in nurseries are members of the genus *Otiorhynchus* (syn. *Brachyrhinus*). These weevils, collectively referred to as root weevils, include the strawberry root weevil, *O. ovatus*; the black vine weevil, *O. sulcatus*; the rough strawberry weevil, *O. rugosostriatus*; and the woods weevil, *Nemocastes incomptus*. Other weevil species that can cause problems in nurseries are the pales weevil, *Hylobius pales*; the pitch-eating weevil, *Pachylobius picivorus*; the Japanese weevil, *Pseudocneorrhinus bifasciatus*; and the yellow-poplar weevil, *Odontopus calceatus*.

## Distribution

The most severe losses due to weevils have been observed in the West, but damage can occur almost anywhere.

## Damage

Weevils sometimes cause serious damage to various species of conifer seedlings, especially in the West where they are among the most serious insect nursery pests. Outright mortality may be widespread. Heavy culling is sometimes necessary due to severe damage.

## Diagnosis

On aboveground plant parts, look for needles with notches or holes (fig. 51.1) or stems with small sections of bark removed. Infested roots or crowns may be



**Figure 51.1**—Notches on needles made by feeding of adult weevils. Photo by Chal Landgren, Oregon State University Extension Service.

entirely stripped of their bark for several centimeters (fig. 51.2) or debarked on only one side. Root-damaged trees may show symptoms reminiscent of damage due to root pathogens. Adult weevils have well-developed snouts with clubbed, elbowed antennae (figs. 51.3 and 51.4). Adults can be found in the soil litter layer during the day and on foliage at night. (Some species estivate in the soil during hot summer months and become active in the fall.) Larvae are legless and C-shaped, with shiny smooth heads, and pale cylindrical bodies (fig. 51.5).

## Biology

The life histories of weevils vary according to species and geographic influences. A generalized life history of the root weevils mentioned previously will serve as an example. Weevils overwinter as larvae or sometimes as pupae and adults at soil



**Figure 51.2**—Bark stripped from the lower stem and roots of a fir seedling by feeding of weevil larvae. Photo by Thomas D. Landis, USDA Forest Service.

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**Figure 51.3**—Adult black vine weevil. Photo by Ken Gray. Image courtesy of Oregon State University.

depths of 15 to 20 cm (6 to 8 in). They emerge as adults from early May to late July. These adults are present throughout the remainder of the growing season. Sometimes two weevil generations are born per year, but one is more common. The weevils are night feeders, preferring to hide beneath leaves, stubs, stones, and other debris during the day. At night, they become active, climbing seedling stems and eating notches in needles and stems. Egg-laying begins about 4 to 6 weeks after adults appear and can continue until September, depending on species. In about 20 days, the eggs hatch, and the tiny larvae move deeper into the soil, where they feed first on fine roots and later on larger roots. Pupation occurs in cells just beneath the soil surface.

### Monitoring

Determining the onset of adult weevil emergence and feeding is important in maximizing egg-laying suppression since newly emerged females do not begin to lay eggs for 30 days or more. If effective control methods are implemented within 1 month after emergence, it is possible to reduce the local weevil population by nearly 100 percent. Several monitoring



**Figure 51.4**—Adult obscure root weevil. Photo by Ken Gray. Image courtesy of Oregon State University.

techniques can be employed to determine the onset of weevil emergence. New leaves can be observed in early spring for notching. In addition, the presence of adults can be confirmed at night in early spring with a flashlight by inspecting foliage of strategically placed bait or trap crops, such as susceptible, nonresistant rhododendrons on warm, still evenings. Trapping is still another technique worthy of discussion. Laying a small piece of cardboard at the base of affected plants

provides a hiding place that can be checked the next morning. Pitfall traps buried near the plants will achieve the same end.

### Control

#### Cultural

Practicing clean cultivation, rotating transplant beds, and allowing infested areas to lie fallow and be thoroughly cultivated in alternate years are effective methods of reducing weevil populations.

#### Chemical

Fumigate seedbeds with a registered product before seeds are sown. Fumigation is very effective in controlling soil-inhabiting insects like weevils. Application of a registered adulticide may be advisable. Make sure application occurs before egg-laying begins.



**Figure 51.5**—Root weevil larvae. Photo by Art Antonelli, Washington State University.

## Biological

Entomophagous nematodes can control weevils very effectively in container-grown crops. These creatures contain lethal bacteria that are released into the body cavities of larvae and pupae. There are several caveats that need to be adhered to if this technique is to be effective. First, inspect the product for quality and morbidity to be certain the nematodes are mostly alive at time of purchase. Also, thoroughly wet the soil prior to application so that the nematodes can move through the soil particles easily in search of larvae and to maintain their own body moisture. Never apply the nematodes in direct sunlight since ultraviolet light will kill them. The best time for application

is probably in the morning before the sun comes up or in the evening as the sun is setting. The soil temperature must be 11 °C (52 °F) or warmer at the time of application to activate the nematodes. Finally, if you apply nematodes with a sprayer that has a filtering mesh screen in the nozzle be sure to remove it because it will stop movement of the nematodes through the nozzle and onto the soil.

## Selected References

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