

SMALL FRUIT CROPS

CORNELL COOPERATIVE EXTENSION

Root Weevils

Otiorhynchus spp.













There are more than 20 species of root weevils that attack strawberry in the United States. In New York, the three major species are the black vine weevil, *Otiorhynchus sulcatus* (Fabricius), the strawberry root weevil, *O. ovatus* L., and the rough strawberry weevil, *O. rugostriatus* Goeze. Root weevils are also pests of raspberries and rhododendrons.

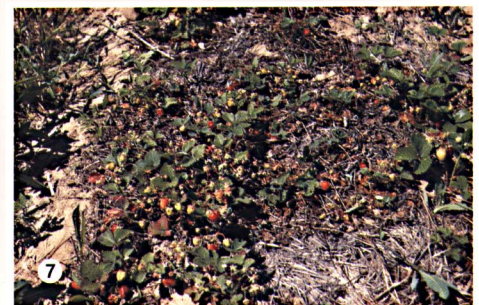
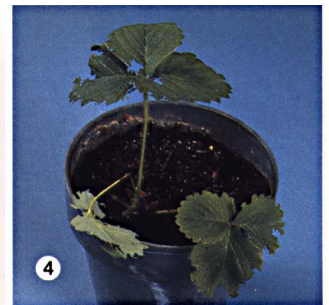
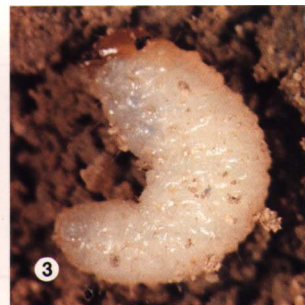
The Adult

The root weevil adult (fig. 1) is a brown to black beetle, with rows of pits or punctures along its back. Like other weevils,

its mouthparts are extended into a snout. The three species discussed here look similar but differ in size. The strawberry root weevil is the smallest, about 5 mm (0.2 in.) long and black to light brown; the rough strawberry weevil is generally an even chocolate brown and 6.4 mm (0.25 in.) long; and the black vine weevil sometimes has small flecks of yellow on its black body and can reach 1 cm (0.4 in.) in length (fig. 1).

Adults of *Otiorhynchus* generally emerge in late May through June from puparia in the soil. They feed at night on foliage and hide during the day. After a period of approximately 30 to 60 days (for the black vine weevil) or 10 to 14 days (strawberry root weevil), they begin to lay eggs (fig. 2).

	Eggs	Larvae	Pupae	Adults
Strawberry Root Weevil				
Rough Strawberry Weevil				
Black Vine Weevil				
		1st Instar	last	



Some larvae of these two species do not pupate in the spring and will remain in the soil throughout the summer. They then pupate in the fall and overwinter as adults, to emerge the following spring.

The Eggs

Depending on the species, peak egg laying occurs from late July through August. Eggs are laid in the soil around the plants; they are pearly white when laid, but soon change to an amber color. Eggs of the strawberry root weevil are 0.4 mm by 0.5 mm (0.02 in. long); those of the black vine weevil are 0.6 mm (0.03 in.) spheres.

The Larvae and Pupae

Larvae, or “grubs,” are creamy-white or dirty-white to brown, have no legs, and lie in a characteristic “C” position in the soil (fig. 3). Grubs of the strawberry root weevil are about 6 mm (0.25 in.) long when fully grown; those of the black vine weevil are 12 mm (0.5 in.) long. By October, most of the eggs have hatched into larvae; hatching occurs about ten days after the eggs are laid. Young larvae feed on fine roots and bark in mid-summer, overwinter in the soil, and cause their heaviest damage in the spring.

Black vine weevil pupae are soft and white. Adults emerge after a short pupation period in April and May. There is only one generation per year.

Damage

Adult root weevils eat notches in the leaves (fig. 4), but this damage is seldom important. The larvae, however, cause

serious damage by tunneling in the roots and crowns as they feed on the strawberry plant (fig. 5; damaged roots on left). Most damage to the roots is caused by the later instars of larvae in March and April. Plants become stunted and darkened, and this damage can weaken or kill the plant (fig. 6, damaged plant on left). Injured plants have a stunted appearance; the leaves are closely bunched and are dark blue-green. The fine roots have been destroyed, and sometimes even the hard fibrous roots have been eaten.

Heavily damaged areas in the field can be large—sometimes up to 0.2 ha (.5 acre)—and circular (fig. 7), because of the beetles’ behavior of gathering in groups. Without control, damage can be so severe by the second fruiting year that early termination of the planting is necessary. Newly transplanted strawberry plants can be particularly susceptible to black vine weevils.

Monitoring and Control

Because there are three or more species of root weevils in New York, precise identification is essential for adequate control. Adults should be collected for proper identification.

To prevent the spread of insects to other beds, plow under old beds as soon as possible. Postharvest foliar sprays to control the adult beetles during the summer are the most common treatment. Present research is directed at optimum timing of this treatment; it should be delayed until as many adults as possible have emerged, yet applied before egg laying begins. This approach will not control those individuals overwintering as adults.

Consult local Cooperative Extension recommendations for the proper pest management procedures for your area.

Guide to Stages

Stage	Timing	Where to Look
Adults	Late June to August	Foliage; examine for leaf damage (notching)
Eggs	July to August	In soil
Larvae	September to April	In roots (split them open to check for tunnels)

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