

The Strawberry Crown Moth

A Pest of Strawberries and Caneberries

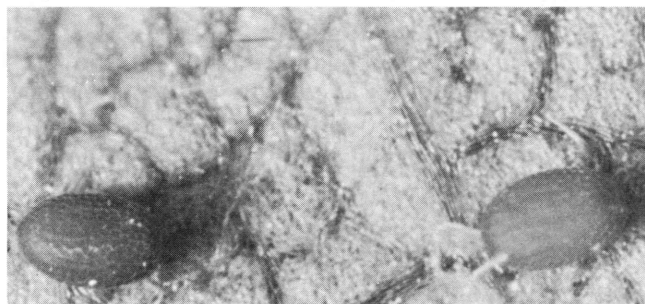
The strawberry crown moth, *Synanthedon bibionipennis* (Biosduval), is a serious pest of strawberries, raspberries, blackberries, and loganberries in Oregon. This insect is native to the Pacific Northwest and occurs south from British Columbia to California and east to the Rocky Mountains. The larvae of this moth destroy the crown and root tissues of strawberry plants by feeding in these areas. The feeding process wounds the plant and allows the entry of root diseases. Injured plants appear stunted, produce poor fruit yields, and readily separate from the root at the crown line when pulled on. This last symptom distinguishes crown moth damage from root weevil damage. The strawberry crown moth has become widespread in the northern Willamette Valley in the last 4 years.

Description

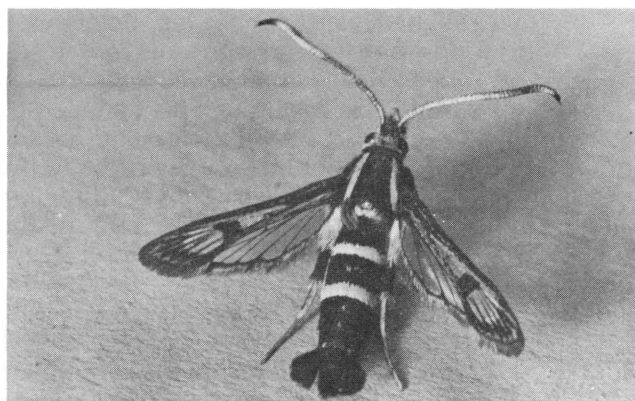
The general color and flight pattern of the strawberry crown moth adult resemble that of a yellow jacket. In fact, strawberry pickers often mistake the adults for wasps or hornets. The adult moth, about 1/2 inch (12 mm) in length, has a black body with two or three yellow marks on the thorax, the part of the body where the legs are attached. Unlike most moths, the strawberry crown moth has hind wings that are transparent and forewings that contain two transparent patches.

The eggs of the strawberry crown moth are brown, oval-shaped, and approximately 1/50 of an inch (.53 mm) long. The eggs are sculptured on the

surface and distinctly cupped on the sides. The larva, only 1/16 inch (1.15 mm) when first hatched, grows to a length of approximately 4/5 inch (20 mm) at maturity. The larva has a white body and a dark brown head. The abdomen, however, may take on a pinkish or brown color from the food inside. The larva has three pairs of wiry, brownish legs on the thorax and five pairs of prolegs (fleshy swellings) on the abdomen.



Eggs, larva, and pupal stage of strawberry crown moth



Strawberry crown moth adult

In caneberries, the larva of the strawberry crown moth is likely to be confused with that of the



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raspberry crown borer, *Bembecia marginata*. These two species can be distinguished by the last row of prolegs on the abdomen—the strawberry crown moth has a row of brown hooks (crochets) and the raspberry crown borer does not. Raspberry crown borer larvae have a 2-year life cycle and are much larger than crown moth larvae at maturity. Also, the crown borer larvae tunnel into the crown near the base of the canes, while the strawberry crown moth larvae girdle the roots and lower crown of the plant with superficial tunnels that do not penetrate. In caneberries, the tunnels of the strawberry crown moth are exposed to the soil surface. The crown moth pupa is about 1/2 to 5/8 (12 to 15 mm) long and brown.

Life History

The strawberry crown moth overwinters as a nearly mature larva in the crown of the strawberry. When temperatures increase in the spring, the larvae feed for a 2- to 6-week period. The larva pupates during May and June within a frass-covered silk cocoon. The pupal stage lasts approximately 3 weeks. Just before emergence, the pupa forces itself out of the cocoon with the help of rows of spines on its abdomen. The pupa then wiggles out of a hole previously eaten in the strawberry crown by the larva. The moth then emerges from the pupal case, leaving the case among the old stems near the crown of the plant. Adults emerge from late May through July. Peak emergence varies from season to season but usually occurs during the last of the strawberry harvest in late June or early July.

Females begin to attract males the day of emergence, and mating and egg deposition commence within 1 or 2 days. A female depositing eggs flies very low over the tops of the strawberry plants. After landing on a plant, the moth usually crawls to the dead leaves and stems at the base of the plant and gets as close to the crown as possible. Eggs usually are deposited on dead leaves or on the crown. Occasionally, the eggs are placed on the undersides of green leaves. It usually takes from 10 to 14 days for the eggs to hatch. Most of the eggs hatch between late June and mid-August.

The newly hatched larva feeds in and on the strawberry crown and roots, just under the epidermis. Also, the larva may travel down the crown and feed on the bases of small rootlets or, temporarily, within a rootlet. As the larva grows older, it burrows deeper into the pith of the crown and continues to feed and grow until late fall. In October or November the larva spins a silken cell and passes the winter in diapause (hibernation).

Control

Insectidal control of the strawberry crown moth in producing strawberry fields has not been effective. A complicating factor is that the flight period of the adult coincides with the strawberry harvest.

Certain cultural practices may help in reducing infestations of the strawberry crown moth.

✓ Minimize light infestations by removing infested plants and either replanting or allowing runners to fill the area.

✓ Following harvest, leave a couple of rows of untopped plants to attract the ovipositing females; in late seasons, the females may concentrate their egg laying on these untopped plants. These rows should be disked under in late August or September. This practice, however, may not be effective in early seasons, as a large number of eggs have been laid prior to topping.

✓ Wait until mid-August to disk under infested fields. This will help to concentrate egg laying in these fields and minimize dispersal of adult moths to other fields. This practice will be most effective if the infested field is separated from other fields by a grainfield, wooded area, or a distance of 1/4 mile. Spring cultivation of fields is less effective because the larvae that have not been injured will be able to complete development in the dead plant material. Plowing to a depth of 10 inches will help to bury the larvae deep enough to prevent adult emergence.

✓ Avoid planting new strawberry fields adjacent to infested ones. If new plantings are established next to infested ones, plant a fall or spring grain crop between them to confine most of the moths to the old field. Because the moths are low fliers, they are somewhat restricted by objects more than 3 feet tall such as a field of grain.

✓ Treat newly planted fields with endosulfan (Thiodan), Lorsban, Azinphosmethyl (Guthion), or diazinon during June and July. Similar treatments on producing fields should also be effective. Be sure to observe interval between last application and harvest. Systemic insecticides are not effective on strawberry crown moth.

✓ Treat raspberries, loganberries, boysenberries, and Marion berries growing adjacent to an infested strawberry field with an insecticide drench in the fall or spring. This will protect the caneberries from strawberry crown moth damage and reduce migration of the moth from the caneberries to the strawberries. Azinphosmethyl (Guthion) or diazinon, when applied as a crown drench to control the raspberry crown borer, will also control the strawberry crown moth. *Note:* This technique does not work on strawberries because the larvae are completely enclosed in the crown and root tissues and therefore not contacted by the insecticide. On caneberries, the larvae are exposed to the soil surface and are readily controlled by the drenching method.

Prepared by Glenn C. Fisher, Extension entomologist, and W. A. Sheets, Extension agent, Washington County, Oregon State University.