CRANBERRY GIRDLER

Common Name: Cranberry girdler
Scientific Name: *Chrysoteuchia topiaria*
Order: Lepidoptera (butterflies and moths)
Family: Pyralidae (pyralid, grass, wax, and snout moths)

Cranberry girdler is a pest of cranberry runners at or below the soil surface. The larvae remove the bark and conductive tissues of the stems, thereby "girdling" them and cutting off movement of water and nutrients in the plant. The result can be death of uprights in small localized areas or in larger patches. The damage is easily diagnosed by looking for the chewing on the horizontal stems.

Biology and Damage

Host Plants:
Wide range of host plants. Cranberry girdler is considered a member of the sod webworm complex and it frequently feeds on the roots of cultivated and wild grasses.
Cranberry, *Vaccinium macrocarpon*
Sheep sorrel, *Rumex acetosella*
Douglas-fir, *Pseudotsuga menziesii*

Description and Diagnosis:
Eggs are deposited randomly in the leaf litter and are initially white but change to an orangish-red color close to hatch. The female can lay as many as 700 eggs with up to 300 deposited the first day. The eggs are oval and are 0.4-0.5 mm long. The larvae are white with a brown head and a number of black hairs of various lengths are on each body segment. They can reach a maximum of 15.0 mm long. The pupae are pale yellow, 10 mm long, and are located within a cocoon made of pieces of twigs, leaves, or other scraps found in the leaf litter and joined together with silk strands. This makes a perfect camouflage making them very difficult to locate on the cranberry bed floor. The adult's body is silvery white with the forewings a pale straw color with silver bands. The wingspan is 15.0-17.0 mm and they are strong fliers. The moths are slender in appearance and appear to have a "snout".

Adult moth.

Larva (in soil).

Economic Importance:
The cranberry girdler can be a serious pests of cranberries due to the severe vine damage they cause. Often, the damage is not detected until the vines begin to die in late August or September. The foliage drops off leaving areas of dead vines, especially when the winter flood is removed. This open space is vulnerable to sedges and grasses that invade the beds before new runners can spread out and re-cover the area.

Life Cycle:
The cranberry girdler overwinters as a fully grown larva in a cocoon buried in the leaf litter on the beds. After the winter flood is removed in early spring, the larva pupates within the cocoon and the adults begin to emerge in June. Adult emergence can continue through August. The eggs are laid randomly on the cranberry bed floor and the larvae emerge in 10-12 days. The larvae prefer drier locations with a considerable build-up of fallen leaves and trash. The larvae feed on the vines just above the soil surface and are hidden from view in the trash layer. There is only one generation per season and the larvae spin a cocoon to overwinter in late September to early October.

Environmental Factors:
Cranberry girdler larvae are sensitive to flooding in August or September and are easily drowned. However, because of their concealed feeding in the leaf litter, they are not very susceptible to parasitic insects. Spiders, ground beetles, and birds prey on the adults but are not important factors in girdler control. Ants, ground beetles, rove beetles, and other predators kill lots of eggs and young larvae.

Damage/Symptoms:
The cranberry girdler larvae eat through the bark of the subterranean runners which can completely sever the vine. More commonly, the larvae gnaw the bark completely around a runner (girdling) which kills the vine beyond that point. The roots can also be attacked. Often, the larvae do not completely girdle the vine but they become weakened and produce fruit of reduced vigor. The foliage becomes red or brown in September due to the reduced quality of the vines, and many of the leaves drop off, especially during the winter flood, leaving areas of dead vines. It can take years for new runners to spread out and re-cover the area.

Larval feeding, removing bark from stem in soil.

Dead spots in bed caused by larval feeding in the soil.

Monitoring and Controls

Scouting Procedure/Economic Threshold:
Pheromone baits are commercially available for monitoring the flight period of cranberry girdler. No economic thresholds have been established. Larval monitoring in the soil is very difficult and very destructive to the planting.

Check for thin or off-colored areas of beds in late summer, again after the removal of the winter flood, and again after the vines have greened up after the start of growth. If suspicious areas are found, check the underground stems for signs of feeding on the bark. Girdling may also be caused by flea beetle larvae -- see the profile for cranberry flea beetle.

A model of percent emergence of girdler moths is incorporated in Cranberry Crop Manager software.

Natural Control:
Predators, such as spiders and ground beetles, feed on cranberry girdler eggs and larvae.

Cultural Control:
Sanding greatly reduces the emergence of cranberry girdler moths and reduces the infestation. Wisconsin growers have had success using a summer flood to control cranberry girdler.

Biological Control:
Beds that receive few applications of broad spectrum insecticides will have more beneficial soil fauna (including predators such as spiders and ground beetles) than beds receiving more insecticide applications. More predation of girdler eggs, larvae, and pupae will occur in such beds.

Commercially-available insect-parasitic nematodes, though expensive, are effective for controlling cranberry girdler larvae. Such products can be applied through conventional pesticide application equipment, including sprinklers. Applications should be made in summer after the eggs have hatched. Nematodes are living animals and must be stored, handled, and applied carefully in order to be fully effective. Carefully follow the instructions provided by suppliers.

Chemical Control:
Diazinon 14G (14% granular formulation) continues to be registered on a state Special Local Needs Label for girdler control. As this label must be periodically renewed, check with your chemical distributor, IPM consultant, or with university extension personnel. NOTE: not all diazinon 14G registrants request this SLN label; again, check with your distributor.

Application should be made shortly after the peak of egg hatch. Peak egg hatch will be approximately 110 degree days (°C, based on a 9°C base temperature) after peak flight (about 2-3 weeks after peak flight). Diazinon 14G needs to be watered in to be effective. Diazinon 14G can not be applied by air, and an untreated buffer must be left between application areas and ditches. **NOTE:** diazinon uses on cranberry may be stopped by EPA in 2007 or 2008. Check with your chemical supplier or UW Extension.

Growers have reported success using spray insecticides targeted against the adult stage. However, the emergence and flight period is extended (6-8 weeks) and multiple applications may be necessary using this approach.

References:

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This information was prepared by Daniel L. Mahr, Professor and Extension Fruit Crops Entomologist, University of Wisconsin – Madison. It is revised and modified from the Pest Profiles section of University of Wisconsin Cranberry Crop Management software (CCM). November, 2005.

Photo credits. Photos of bed damage and larva by S. L. Roberts while UW Entomology Research Assistant. Photo of stem damage from UW Entomology collection. Photo of adult courtesy C. F. Koval, UW Department of Entomology.