

Grape Root Borer (*Vitacea polistiformis*)

Description and Life Cycle

Larvae of the grape root borer attack the larger roots and crown of grapevines. They tunnel into these parts of the plant and feed internally. The feeding and boring of the larvae will weaken and may eventually kill the vine.

The adult is a clear-wing moth, with the forewings brown and the hindwings clear with brown borders. The body mimics that of a wasp, brown with yellow markings. Male moths measure about 5/8 inch in length, while the female is larger, about 3/4 inch long. The moths emerge from the soil during July and August. Eggs are deposited individually on grape leaves or weeds, or dropped on the ground close to the trunk. The larvae hatch and burrow into the soil, find their way to the roots and crown, and feed on them. Larvae continue to feed within the vine and root system for about 22 months. A fully developed larva is about 1 1/2 inches long and white with a brown head capsule. Mature larvae move to places just under the surface of the soil and pupate in earthen cells. Adults start emerging in July and continue to emerge through August.

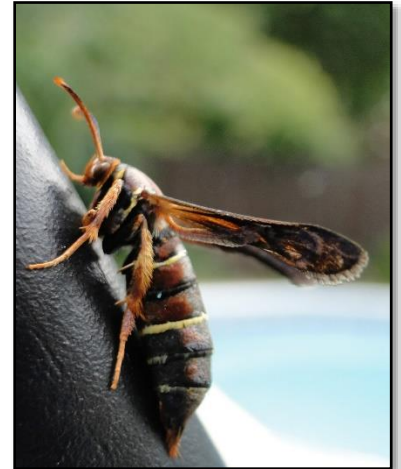


Figure 1. Adult grape root borer (Photo Credit: Hannah Burrack)



Figure 2. (Left) Adult grape root borer (Photo: David Copeland) (Right) Larvae of the grape root borer inside a grapevine root. (Photo from Virginiafruit.ento.vt.edu)

Damage Systems

Larvae attack the roots and crown of grapevines. They tunnel into the roots or crown and feed internally. Feeding and boring weaken the grapevine and may eventually kill it. Larvae also provide entry points for disease organisms. Vines that are severely infested may wilt under stress; sometimes only part of the vine will show stress.

Management and Control

Weed control is important in managing this insect pest. Weed control decreases the number of oviposition sites and provides an area under the trellis suitable for applying an insecticide. Researchers in North Carolina also have achieved good control of root borers with polyethylene mulch, this technique can be easily accomplished at planting. It works well for a while but the mulch must be maintained over the years in order to be successful. The utilization of plastic mulch has proved success in controlling root diseases and pests, however it does have to downside of being costly to install and discard after the season. Several companies now offer bio-degradable versions though.

An alternative method of control using pheromone rope ties to disrupt the males of the grape root borer is being tested by researchers at Ohio State University. This method prevents the male root borers from locating the female borers and mating, thus reducing the number of fertile root borer females in a treated vineyard. Ties are dispensed manually at a rate of 100 ties/acre. They should be placed on the top trellis wire every 6 or 7 vines. Results from these trials look promising, but bringing the borer population down to acceptable levels requires several years. Another method of utilizing the grape root borer pheromone for control is being studied at two southern Ohio vineyards. This method utilizes the sex pheromone and 1C Pherocon® traps. Traps baited with the pheromone are placed throughout the vineyard in an attempt to reduce the number of males available for mating. This study has been underway for 3 years now and the male population is continuing to decline by an average of about 30% per year. External woodlots containing wild grapes are a good source of grape root borers. Such areas adjacent to vineyards should be considered when trying to manage this pest. Extermination of wild grapes from within these areas may help to reduce root borer pressure.

Trapping out utilizes the sex pheromone placed within 1C Pherocon® sticky traps. This method is still experimental at this time but certainly appears to be working. Traps are placed around the vineyard perimeter in late June at 35 to 50 foot intervals. These traps should be checked on a weekly basis. Where infestations are high, many borers will be trapped resulting in the need for removal of some of the trapped adults or replacement of the trap bottoms. This method requires a continued effort year after year to reduce pressure subsequent years.

The use of beneficial nematodes has been a proven success in controlling the grape root borer. For more information on the application of nematodes, a study was done in 2002 by Dr. Roger N. Williams and Parwinder S. Grewal on *Assessing the Potential of Entomopathogenic Nematodes to Control the Grape Root Borer Through Laboratory and Greenhouse Bioassays*.

Monitoring

Pheromone traps are the only means to easily monitor this pest. Response by male root borers to this sex pheromone is strong. A minimum of 3 pheromone traps should be placed transecting the vineyard in a diagonal manner. Traps should be in place by late June and checked on a weekly basis thereafter. A single pheromone cap within a trap will last the entire season.