



## Grape Cane Borer

*Amphicerus bicaudatus*

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### Introduction

The grape cane borer is a wood feeding beetle in the Bostrichidae family that is widely distributed across eastern North America and in Europe. Also known as the apple twig borer, adult beetles tunnel into live grape canes (or apple twigs) during late summer or early fall damaging and reducing the fruitfulness of the affected canes. In New York State significant damage has historically occurred near Keuka Lake, and this beetle is also found across the Finger Lakes and Lake Erie growing regions as well as other grape-growing areas in the east.

### Life Stages

Grape cane borers complete one generation per year.

### Adults

Adults are brown to black in color, cylindrical, and 1cm long (Figure 1). Male beetles may have a pair of hornlike bumps on the tips of their forewings (elytra), but this is not always the case. In New York new adults emerge from dead grape wood around mid-August. For a period of two to three weeks the adults feed on dead wood in and around the vineyard. They generally prefer to feed on the pith (spongy area in the middle of the cane) and in the process generate sawdust that is conspicuous on the leaves. This can be used as an indication of their presence in the vineyard at this time of year (Figure 2). Adults begin to bore into live grape canes in early September



Figure 1: Adult grape cane borer in a damaged grape cane

as shoots start to harden off. They typically penetrate the live wood where the current and last year's growth meet, or at buds on current-year wood (Figure 3). The tunnel is remarkably circular in shape. After over-wintering as adults in the live wood they emerge again in the early, warm days of spring around the time when strong sap flow begins. They return to feeding on dead wood in the vineyard during the spring. Mating is thought to occur at this time.

### Eggs

Eggs are laid between mid-May and mid-June. The eggs, less than 1mm in length, are creamy white in color and oblong in shape with a small nipple on one end (Figure 4). Eggs are deposited into the crevices and folds of bark. Preferred oviposition sites include dead or dying grape wood in its second or third year of growth, with shredded bark. Eggs start to develop immediately after oviposition and egg hatch occurs from late May to early July in New York State.

### Larvae

After eggs hatch larvae burrow directly into the dead or dying canes. The larvae, 1 to 8 mm in length, are white with an enlarged head region and three pair of short legs close to the head region (Figure 5). They are not very mobile and will penetrate the wood near where they hatch. Early feeding is just below the bark, while older larvae enter the pith, leaving a sawdust-filled channel behind. Larvae complete their development and form pupae in dead wood in early- to mid-August.

### Pupae

Grape cane borers remain in the pupal stage (Figure 6) for two to three weeks from mid-August to early September in New York. This stage of development occurs in the tunnels created by the larvae in the dead wood in and around the vineyard.



Figure 2: Sawdust generated by adults feeding on deadwood in late summer



Figure 3: Entry hole in grape cane at transition between new and old wood

**Damage**

Vine damage occurs from mid-September into the fall season, when adult beetles burrow into live canes in search of overwintering sites. Most often they burrow into live canes where new canes meet the previous year's wood (Figure 3), but can also burrow directly into new grape canes. Canes are weakened at the 0.4cm diameter entry hole, and are prone to break at the weak point during pruning and tying. Grape cane borer

damage can reduce node survival and fruitfulness, the number of clusters per cane, and cluster weight. In some cultivars this damage can reduce yield on affected canes by 30-50%. Their damage can also delay establishment of the training system in young vineyards. Specific economic thresholds have not been determined.

**Management**

If low levels of grape cane borer are present in your vineyard, populations can be reduced by cultural practices such as removal and destruction of affected canes and excess dead wood from the canopy during pruning. In addition to cultural practices, treatment with insecticide between onset of sap flow and bud break in the spring, or as vines begin to harden off in the early fall might provide some control. Insecticide treatments should target the adults as they migrate between dead wood and live canes and correspond with egg laying in the spring and movement to overwintering sites (live canes) in the fall. Refer to the New York and Pennsylvania Pest Management Guidelines for Grapes for proper insecticides and spray timings.



Figure 4: Grape cane borer egg



Figure 5: Grape cane borer larva



Figure 6: Grape cane borer pupa in dead grape cane

Seasonal Occurrence of Grape Cane Borer							
Adult						Over-wintering Stage	
Egg							
Larva							
Pupa							
	April	May	June	July	August	Sept.	Oct.- March

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