



## Bug-Wise

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**Peach Tree Borers, Raspberry Crown Borers and Grape Root Borers:** In addition to being important insect pests of fruit crops, these insects have something else in common; they are all members of a somewhat unusual family of moths, the Sesiidae. Unlike most moths, sesiid moths fly about during the day, but they are rarely attacked by birds because they closely resemble paper wasps and even sound like wasps in flight. Some resemble red wasps; some mimic Guinea wasps; some look like hornets; and some just look wasp-like. Despite their appearance, the moths are harmless. It is the larvae that cause the damage—by boring into the trunk, main stem, or roots of their host plant. Here we briefly discuss four species of sesiids that are important fruit pests. Squash vine borers and dogwood borers are two other members of this family.

**Peach Tree Borers:** Peach tree borers are important pests of peaches, both commercial peaches and dooryard peaches, as well as plums and nectarines. They also attack ornamental *Prunus* species such as cherry laurel, flowering cherries and purple-leaf plums. Peach tree borer infestations are often accompanied by gummy, sawdust-filled exudates at the site of attack. Heavy infestations normally occur in late summer and fall.

There are actually two species of peach tree borers: peach tree borer (PTB), *Synanthedon exitosa*, and lesser peach tree borer, *Synanthedon pictipes*. Peach tree borers usually focus their attack on the lower 10 to 12 inches of the trunk to around three inches below ground level, while lesser peach tree borers attack higher on the trunk and on larger scaffold limbs. PTB is generally the more damaging of these two species.

Adult PTB are wasp-like, day-flying moths. Females of *S. exitosa* lay eggs on the bark of the tree at or near the root flare region. They are especially attracted to trees on which the bark has been injured. The eggs hatch in about seven days and the larvae bore into the bark where they feed on the cambium, slowly growing to about an inch in length. Their feeding weakens the tree and infestations by multiple larvae can girdle even large trees. PTB overwinter as partially grown larvae in their galleries under the bark. If PTB is not controlled, trees may die as the result of cumulative damage. Young, small diameter trees are especially vulnerable.

The key to controlling PTB is to kill the newly hatched larvae before they have a chance to bore into the bark. This means applying a trunk spray with a long residual insecticide at the proper time of year so the newly hatched larvae have to crawl through the insecticide residue as they bore into the bark. Although low numbers of moths may be active in June and July, heavy PTB moth flight does not occur until August and September, usually peaking around early September. This is the time to apply basal trunk sprays for PTB control.

*Peach Tree Borer Control in Commercial Orchards:* Lorsban (chlorpyrifos) is the treatment of choice for peach tree borer control in commercial orchards (The 75 WG formulation may be used in Mississippi, but the 4 EC formulation may not). Do not apply before harvest is complete. Mix according to label directions and apply as directed. Use a low pressure spray to the trunk

and lower scaffold limbs and take special care to treat the base of the tree and exposed root flare. Do not treat foliage. A single application of Lorsban applied around mid-August (or after harvest on late-maturing varieties) is sufficient, and the label only allows one application per year. Thionex (endosulfan) is also recommended for use in commercial orchards, but two applications are recommended—one in early August and a second in early September. Commercial growers rely on the cover sprays they apply to control other pests to control lesser peach tree borer the few PTB moths that fly earlier in the season.

Mating-disruption, by timely use of pheromone impregnated lures, can be a useful PTB control method for commercial growers, but do not confuse the use of pheromone traps with mating disruption. Pheromone traps can be useful for timing PTB sprays, because they indicate when moths are actively flying, but they do not provide mating disruption. If you use pheromone traps be aware that they may attract a wide range of other sessid moths in addition to PTB (the pheromone is not very species specific). This means you need to know what male PTBs look like before counting trap captures (only male moths are attracted to the pheromone and male PTBs look much different than females).

*Peach Tree Borer Control for Homeowners:* The best PTB control option available to homeowners at this time is to select a formulation of permethrin that is labeled for use on fruit trees and apply as a basal trunk spray, using the maximum labeled rate. Make the first treatment in early August and retreat every two to three weeks through the end of September. Hi-Yield Garden Pet and Livestock Spray is one example of a 10% permethrin concentrate that is labeled for use on peaches and plums, and this product is labeled for lesser peach tree borer control. The highest rate labeled for fruit trees is 0.5 fl. Oz/gallon of spray. Gardeners treating ornamental cherries and plums may use up to 3 fl. Oz/gallon. This higher rate is specified in the section of the label regarding bark beetle and borer control in ornamental trees and shrubs. Avoid applying permethrin sprays to foliage because permethrin can flare spider mite populations, and there are no good homeowner options for spider mite control. Maintaining healthy vigorous trees, pruning properly and avoiding mechanical injury to the bark will help make trees less susceptible to PTB.

*Is it really peach tree borers?* Peach trees exude masses of jelly-like sap through their bark in response to many kinds of injury: physical injury, freeze injury, disease, or peach tree bores. If PTB is the cause there will usually be fine sawdust, or frass, mixed into that oozing jelly. If the jelly is clear of sawdust suspect some other cause. Gummosis is a fungal disease that causes trees to exude masses of gummy sap through the bark along the trunk or infected limbs. If a tree has numerous masses of gummy exudate that occur up the trunk well above the soil line or on scaffold limbs and do not contain frass or sawdust they are most likely due to gummosis or some other non-PTB cause, especially if these symptoms occur before mid-August. Check with a plant pathologist for identification and control recommendations if you suspect gummosis.

**Raspberry Crown Borer:** Raspberry crown borer (RCB), *Pennisetia marginata*, is an important pest of commercial blackberries. The larvae borer in the crowns and lower portions of the canes, reducing plant growth and vigor. Although the caterpillars take two years to become adults in more northerly areas, recent research has shown there is one generation per year in Arkansas. Moths emerge and lay eggs in September and October. Control is achieved by drenching the crown area of the plants with an insecticide to kill the newly hatched larvae before they bore into the crown. Bifenthrin (Brigade @ 0.1 lb ai/acre) is the best treatment option for commercial growers to use to control RCB. Research conducted in Arkansas showed that bifenthrin (Brigade) applied during October or early November gave 99 to 100 % control. Organic producers can use insect parasitic nematodes to obtain partial control of RCB.

**Grape Root Borer:** Grape root borer (GRB), *Vitacea polistiformis*, is one of the most damaging insect pests of grapes, including muscadine grapes, grown in the Southeast. The large larvae bore in the roots of the grape plants, killing large roots and reducing plant vigor. Heavy, sustained infestations of GRB can kill plants and reduce vineyard productivity. This is because muscadines produce relatively few large, main roots, and the cumulative, repeated loss of such roots greatly affects plant vigor.

Above ground symptoms of GRB infestation are often subtle with infested vineyards exhibiting an unexplained gradual decline in productivity. Destructively sampling a few vines by digging up and examining the root system can show whether GRB is present. Some years ago we excavated quite a few established muscadine vines at the Truck Crops Experiment Station in Crystal Springs to check for GRB. It was not uncommon to find vines that had lost more than half their major roots to this pest and this root-pruning by GRB appeared to be the primary cause of the decline this vineyard was experiencing.

GRB moths have brown wings and reddish-brown abdomens with narrow bands of yellow or orange around the abdomen. In flight they closely resemble the large red wasps we have here in the Southeast. Female moths deposit their eggs on the foliage or main stem of the grape plants, as well as on weeds growing near the base of the plant. Upon hatching, the young caterpillars drop to the ground and dig in, searching for grape roots. Larval development takes from one to two years. As the larvae feed they move up the root toward the main stem, eventually leaving the root and pupating near the soil surface. Most larvae pupate within 18 inches of the main stem and emerging moths usually leave their shed pupal skins partially protruding from the soil. Learning to recognize and scout for these shed pupal skins near the base of the plant is one, non-destructive, way to determine if your vines are infested and time insecticide applications. Pheromone traps can also be used to monitor RCB populations and moth emergence times.

Unfortunately, the moths emerge over a relatively long time period, roughly July through September, and this wide emergence and egg-laying window makes GRB difficult to control. Lorsban 75 WG (chlorpyrifos) is an effective treatment when applied as a drench in an approximately three foot circle around the main stem to kill emerging moths or newly hatched caterpillars, but this treatment only gives a few weeks of residual control. Lorsban can only be applied one time per season and has a 35 day pre-harvest interval. For commercial growers the question is, “Do I use my one application of Lorsban before harvest or after harvest.” Scouting for shed pupal skins around the base of the plants and/or using pheromone traps to monitor populations of adult males are two tools that can help answer this question.

Other things that can be done to help control GRB include:

- 1} Maintain good weed control around the base of the plants. This reduces egg-laying sites and increases mortality of newly hatched larvae.
- 2} Apply landscape fabric/ground cloth around the base of the plants. This prevents moths from emerging successfully and also reduces establishment of newly hatched caterpillars. This is probably the most practical method for homeowners to use to protect dooryard muscadines.
- 3} Results of recent research have shown mating disruption to be a promising method for GRB control. The objective here is to make it so difficult for male moths to find and mate with females that most female moths go unmated.

Because GRB is such a serious pest of muscadine grapes, serious commercial producers will want to employ a combination of these methods in order to maximize control of this pest.

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This information is for educational and preliminary planning purposes only. Brand names mentioned in this publication are used as examples only. No endorsement of these products is intended. Other appropriately labeled products containing similar active ingredients should provide similar levels of control. Always read and follow the insecticide label.