

# Borers in Peach Trees

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**B**orers that feed under the bark of peach trees are one of the most serious problems of peaches both in commercial orchards and home fruit plantings. Borers also attack cultivated plums, cherries, nectarines, and apricots, as well as wild cherries and wild plums. There are two species of borers: the **peachtree borer** (*Synanthedon exitiosa*), which is sometimes referred to as the greater peachtree borer, and the **lesser peachtree borer** (*Synanthedon pictipes*).

## Damage

Borers feed on the growing inner bark of trees, and tunnel between the inner bark and the sapwood. The bark eventually peels off of damaged areas. Damage weakens the tree and predisposes it to attack by other pests and diseases. A gummy mass mixed with sawdust is usually found on the outer bark at the place where a borer started an attack. Entries are often found where there are cankers or wounds caused by other factors such as winter injury or pruning.

The two species of borer differ in the part of the tree attacked. The peachtree borer attacks healthy bark near the soil line, usually just below the ground line or in the lower 30 cm (12 inches) of the trunk (Figure 1). The peachtree borer can kill a young tree when the trunk is girdled by feeding. The peachtree borer is common in young non-bearing trees. The lesser peachtree borer infests the upper parts of the trunk

and scaffold branches and is most troublesome on injured or weak trees (Figure 2). The lesser peachtree borer is common in large managed orchards.

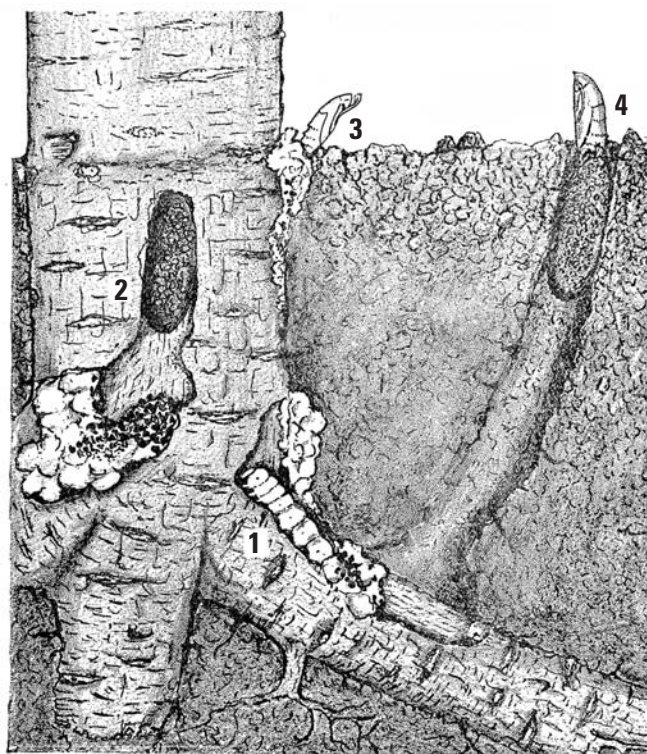


Figure 1. Location of peachtree borer damage at base of tree: larva (1), cocoon (2), empty pupal case (3), and cocoon with pupa emerging (4) (from Gossard & King, 1918, Ohio Agricultural Experiment Station Bulletin 329).

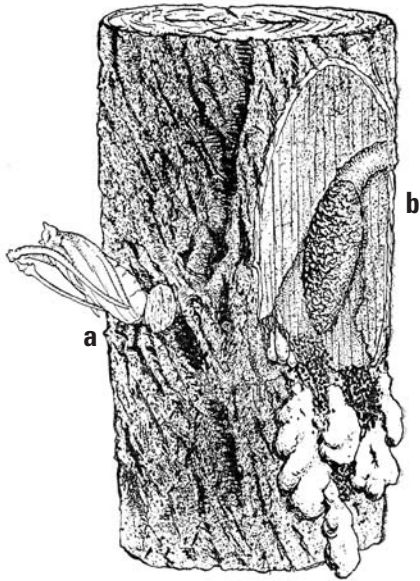


Figure 2. Lesser peachtree borer damage on upper trunk of tree: empty pupal case (a) and cocoon under bark (b) (from J. L. King, 1917, Ohio Agricultural Experiment Station Bulletin 307).

### Appearance

The adult borers are moths that look more like wasps than moths. Unlike most moths, they are active during the daytime rather than at night.

The adult female peachtree borer has a distinctive appearance; she has a dark blue-black body with an orange band on the abdomen, dark blue front wings, and clear hind wings (Figure 3a).

The body of the adult male of both the peachtree borer and the lesser peachtree borer is blue-black, marked with narrow yellow bands on the abdomen, thorax, head, and legs; front wings and hind wings are clear but the edges and veins are outlined with

blue-black scales. The adult males of the two species differ in size, in the intensity of yellow color in their wings, and in the bands on the abdomen. The male peachtree borer (Figure 3b) is 18 to 33 mm (3/4 to 5/4 inch) long, the transparent portions of his wings are strongly tinged with yellow, and at least 3 to 4 narrow bands of yellow are usually visible on the abdomen. The male of lesser peachtree borer is 15 to 23 mm (5/8 to 7/8 inch) long, its wings have a slight yellow tinge, and it usually has only two narrow bands of yellow visible on the abdomen. The adult female of the lesser peachtree borer (Figure 4) is very similar to the male lesser peachtree borer except for features of the antennae and tip of the abdomen.

Eggs of both species are small, oval, reddish brown, and hard. The larva is dull white with a brown head and three pairs of short jointed legs. Larvae of the peachtree borer (Figure 3c) are 1.5 mm (1/16 inch) when first hatched, and 30 mm (5/4 inch) when fully grown. Larvae of the lesser peachtree borer are 0.6 mm (1/32 inch) when first hatched, and 23 mm (7/8 inch) when fully grown.

### Life Cycle

Both species overwinter as inactive larvae under the bark. Each larva resumes feeding and completes its larval stages in the spring. When fully grown, the larva pupates under the bark, then emerges as a new adult. Emergence is greater on days after a rain. The adult is the only stage that leaves the tree. Soon after adults emerge, the female moth lays her eggs under bark scales or on rough bark. Each female lays about 400 eggs. Eggs hatch in eight to ten days into larvae that bore into the tree.

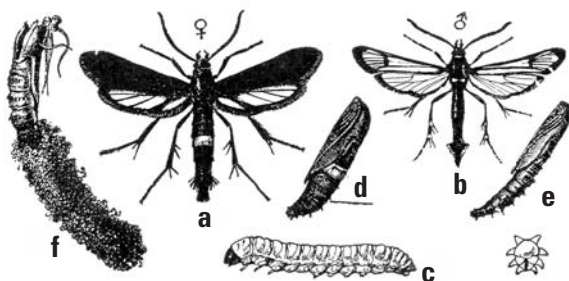


Figure 3. Peachtree borer life stages: adult female (a), adult male (b), fully grown larva (c), female pupa (d), male pupa (e), and cocoon with pupa skin protruding (f) (from USDA).



Figure 4. Lesser peachtree borer: adult female (from J. L. King, 1917, Ohio Agricultural Experiment Station Bulletin 307).

The peachtree borer has only one generation per year. When fully grown, the peachtree borer larva pupates under bark or in the soil near the tree base. In central Ohio, peachtree borer adults start to emerge in early June; emergence peaks in mid-August, and extends into September. Emergence time is a few days earlier in southern Ohio and a few days later in northern Ohio.

The lesser peachtree borer usually has two generations per year in Ohio. The first moths are typically caught in early May, peak catch is in mid-June, and last catch is early July. For the second generation, the first moths are caught in mid-July, peak catch is in mid-August, and last catch is early September. In some years there may be only the early generation.

### **Monitoring**

While pruning in early spring, fruit growers should look for symptoms of borer activity. Symptoms of peachtree borer activity are holes at the base of the tree. Symptoms of lesser peachtree borer activity are holes on the upper trunk and scaffold branches.

In order to determine the most appropriate time to apply insecticide to kill young larvae, a trap baited with a pheromone lure can be used to monitor activity of each species of borer in the adult stage. Pheromones are synthetic products that mimic the natural sex attractant emitted by female moths in order to attract mates. Only male moths are attracted to pheromone traps. Either a sticky trap or a bucket trap can be used. A separate trap is needed for each of the two species of borer. Traps for lesser peachtree borer should be hung 4 to 6 feet above ground and set up in late April. Traps for peachtree borer should be hung 3 to 4 feet from the ground and set up in late May. It is important to notice when emergence begins (when the first moth is trapped) and when emergence reaches a peak (when the number of moths trapped per week is highest). At peak emergence, there may be about 10–50 lesser peachtree borer moths and about 5–25 peachtree borer moths per trap per week.

The pheromone lure for peachtree borer attracts peachtree borer, as it should, but unfortunately it can also attract the lesser peachtree borer and other common non-target species such as the lilac-ash borer.

Trapped moths thus should be examined carefully to be sure the correct species is being counted.

The pheromone lure for lesser peachtree borer attracts lesser peachtree borer, and should repel the peachtree borer, but sometimes non-target species also get caught. Trapped moths thus should be examined carefully to be sure the correct species is being counted.

If a trap for lesser peachtree borer is set up in the same orchard as a trap for peachtree borer, then the two traps should be separated by at least 20 meters (60 feet) to minimize trapping of non-target species.

### **Non-Chemical Control**

#### ***Natural Control***

Several wasp species are known to parasitize eggs or larvae of lesser peachtree borer. Ants, spiders, and lacewings prey on borer larvae in exposed locations, and birds feed on larvae and adults. These natural enemies are not capable of adequately controlling borers.

#### ***Cultural Control***

Avoid improper pruning, mowing, fertilizing, or harvesting operations that injure bark and thus attract borers. Any cultural practices that promote healthy trees will also make borer attacks less likely. Trees should be trained so that branches form wide angles rather than narrow angles.

#### ***Mechanical Control***

In small plantings, borers can be effectively controlled by mechanically killing larvae. In the spring at the time buds are bursting, insert a knife or wire into holes that indicate where borers are located, with the intention of smashing the larvae. This can also be done in late fall.

#### ***Behavioral Control***

Pheromone mating disruption is the name of a tactic for borer control that has been available since the year 2000. Small dispensers filled with pheromone are manually attached to trees throughout the orchard. The dispensers cause the atmosphere throughout the area to be filled with the scent of the borer's sex attractant. Male moths are then unable to locate female moths, so that mating is prevented, and no fertile

eggs are laid. This strategy is most effective in large (>5 acre) plantings. Dispensers look like twist-ties; they are made by Pacific Biocontrol Corporation and available via Great Lakes IPM in Michigan.

The product called 'Isomate-LPTB' is for control of both peachtree borer and lesser peachtree borer. Isomate-LPTB should be used at a rate of 225 dispensers per acre, attached at shoulder-height. Dispensers should be deployed in early May, and are effective for 100 to 120 days.

The product called 'Isomate-P' is for control of only the peachtree borer. Isomate-P should be used at a rate of 100 dispensers per acre. Dispensers should be deployed in early June, and are effective for 100 to 120 days.

### **Chemical Control**

Chemical control is **preventive** when insecticide is applied to trees before borer eggs hatch, so that small borer larvae contact a toxic residue as they crawl into trees. Control may also be achieved by **fumigant** action of the insecticide, which can kill larvae already in trees at the time of application. An insecticide with long residual action gives the best control of borers. Thorough coverage is necessary.

### **How to Apply Insecticide**

Protection from peachtree borer is most critical during the first three to five years after planting. The roots and crowns of new trees should be dipped in insecticide before planting; this will protect them from peachtree borer during their first year. The tree should be dipped to few inches above graft scar, then planted immediately or allowed to dry. The unplanted tree should not be allowed to remain in contact with dip solution.

Starting in the second year, the insecticide for peachtree borer should be applied as a bark drench that runs down the trunk and soaks the ground at the base of the tree. Any prunings, debris, or weeds at the base of trees should be removed so that they do not block the treatment. For lesser peachtree borer, insecticide should be applied as a bark drench to the trunk and scaffold branches. In established plantings, insecticide should be applied as a bark drench at a rate of one-half to one gallon of spray mix per tree.

### **When to Apply Insecticide**

The best time to treat and the number of insecticide applications needed for borer control depend on the severity of the problem and whether one or both species of pest is present.

One insecticide treatment is adequate in orchards where trees show only light signs of damage by borers. If the pest of most concern is peachtree borer, then the best time to treat is at the time of its peak flight, which is usually in early August. If the pest of most concern is the lesser peachtree borer, then the best time to treat is at the time that its second flight is peaking, which is usually in early September; this is usually as a post-harvest application. If trees are infested by both peachtree borer and lesser peachtree borer, then insecticide application should be delayed until early September.

Two insecticide treatments should be made in orchards where borer injury is found on most trees or there is a history of severe damage. If the pest of most concern is lesser peachtree borer, then the first treatment should be applied in about mid-May, or 10 days after adults begin to emerge. The second treatment should be in early August. If the pest of most concern is peachtree borer, then the first treatment should be about late June, or 10 days after adults begin to emerge, and the second treatment at peak emergence, usually in early August.

### **Choice of Insecticides in Home Fruit Plantings**

Several home garden insecticides are allowed for use on peach for borer control. Insecticide should be applied to the bark by a paintbrush or a hand sprayer. Choices include permethrin (such as 'Bonide Borer Miner Killer'), multipurpose orchard pesticide, endosulfan ('Hi-Yield Thiodan'), and carbaryl ('Sevin').

### **Choice of Insecticides in Commercial Orchards**

Insecticide cover sprays applied by conventional air-blast sprayers will help suppress light infestations of lesser peachtree borer but will do little to control peachtree borer; a bark drench with a high-volume, low-pressure handgun is required for good borer control. Chlorpyrifos (Lorsban 4E or Lorsban 75WG) or endosulfan (Thionex 3EC or Thionex 50WP) can

be used. One application of chlorpyrifos is effective for about 12 weeks; one application of endosulfan is effective for about six weeks. Lorsban must be applied to the bark and must not be applied to the fruit; it may be applied only once per year on peaches and nectarines or three times per year on cherries, and it may not be used within 14 days of peach or nectarine harvest or within six days of cherry harvest. Thionex may be used two times per year and it may touch the fruit. Thionex should not be used within 21 days of cherry harvest or 7 days of plum harvest; for peaches, nectarines, and apricots, the pre-harvest restriction is 21 days if used only on the bark or 30

days if used on the fruit. These guidelines are summarized in Table 1.

### Traditional Remedy

A traditional remedy for peachtree borer control in home plantings is to fumigate the bark by placing para-dichlorobenzene (PDB) crystals on the soil around the base of the tree and mounding soil up around the trunk for three to six weeks in September. Although this method is effective and several products are made that have this use specified on the label, none of these products are currently registered in the state of Ohio.

	<b>chlorpyrifos (Lorsban)</b>	<b>endosulfan (Thionex)</b>
Length of control	12 weeks	6 weeks
Part of tree allowed	Bark only	Bark or fruit
Number of applications per year	1 (peach); 3 (cherry)	2
Pre-harvest interval	14 days (peach); 6 days (cherry)	30 days (peach, if fruit treated); 21 days (peach, if only bark treated); 21 days (cherry); 7 days (plum)

This publication contains pesticide recommendations that are subject to change at any time. These recommendations are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. Due to constantly changing labels and product registration, some of the recommendations given in this writing may no longer be legal by the time you read them. If any information in these recommendations disagrees with the label, the recommendation must be disregarded. No endorsement is intended for products mentioned, nor is criticism meant for products not mentioned. The author, The Ohio State University, and Ohio State University Extension assume no liability resulting from the use of these recommendations.

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