

Wood-Boring Beetles

Several types of beetles damage wood used for construction. They are commonly placed into three main groups: powderpost beetles, round-headed borers and flat-headed borers. These three groups include beetles from five scientific families: Lyctidae, Bostrichidae, Anobiidae, Cerambycidae and Buprestidae (Figure 1). Most species are less than 6 mm (¼ inch) long, but a few reach 25 mm (1 inch) in length. Some of the differences between these beetle families are shown in Table 1.

Damage

Wood infested with wood-boring beetles has numerous “shot holes” in the surface. Small pieces of sawdust (frass) produced by the larvae as they tunnel may sift from the holes when the wood is bumped or disturbed. Cutting into the infested wood often reveals many tunnels filled with frass. Characteristics of the frass and the tunnel system vary between different wood-boring beetle species.

Subflooring, hardwood flooring, interior trim, joists, sills and especially beams are subject to attack. Other wood products, such as hardwood furniture, implement handles and ladders, may also be attacked. Log houses are especially vulnerable. Vacation or recreation structures are also more prone to beetle attack because they often have higher moisture content in the wood due to intermittent heating or poor ventilation.

The amount of damage caused by wood-boring beetles will vary based on the species of beetle and their unique feeding and egg-laying preferences. Damage weakens structural timbers and results primarily from the feeding activities of the beetle larvae.

Life history

The stages in the life cycle of wood-boring beetles are illustrated in Figure 2. Young beetle larvae hatch from eggs, burrow into wood, and begin feeding. The larvae of different wood-boring beetle species differ in size and shape (Figure 1), but most larvae are yellowish white with dark mandibles (jaws). The strong jaws enable the larvae to construct tunnels as they feed on starch and other

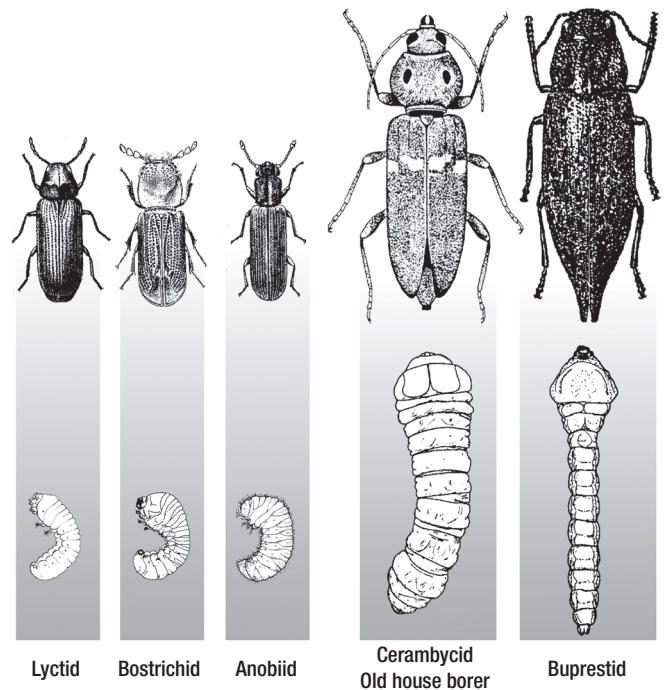


Figure 1. Wood-damaging beetles: adults (top) and larvae (bottom).

compounds within the wood. Wood-damaging beetle larvae often go unnoticed because they feed beneath the surface of the wood and their tunnels are not visible. Feeding tunnels vary in size and shape according to species, and can be distinguished from other types of insect damage (e.g., termites, carpenter ants). The time required for the larvae to complete their development varies from a few months to several years, depending on the species and the availability of food and moisture in the wood.

When beetle larvae have completed their development inside the wood, they pupate. The pupal stage is an inactive developmental period. The pupae eventually change into adult beetles that bore holes to the outside of the wood. The size and shape of these exit holes vary between species (Table 1). Soon after emerging from the wood, adult beetles mate and the newly mated females search for suitable sources of wood in which to lay their eggs. The female often tastes the wood to determine whether suitable levels of starch and moisture exist. Some groups of beetles prefer hardwoods while others prefer softwoods. Most wood-boring species lay eggs only on wood before it is seasoned and processed, but a few species will lay eggs on seasoned lumber.

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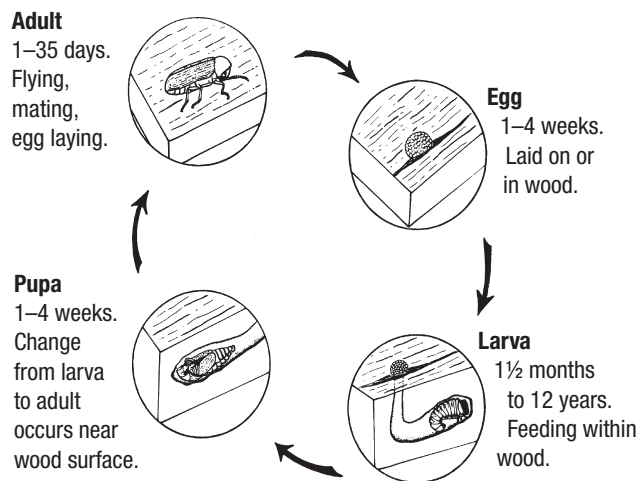


Figure 2. Wood-damaging beetles spend most of their life cycle in the larval stage, in which the damage occurs.

Control

Prevention

Preventing a wood-boring beetle infestation is not always possible because of the hidden feeding activities of the larvae. However, you can reduce the threat of infestation by using seasoned lumber in construction and inspecting lumber and other wood items before purchase.

Sealing exposed wood surfaces with a protective layer of polyurethane, varnish, or paint will also prevent the egg-laying activities of species that can reinfest structural timbers. In addition, firewood should be de-barked, stored outside, and only brought into the home immediately before use.

Reducing moisture levels in structural wood also helps prevent wood-boring beetle infestations. Good ventilation in attics and crawl spaces, in addition to consistent heating and cooling, will maintain wood moisture levels below that required for growth and development of beetle larvae.

Nonchemical control

The use of heat is effective in controlling populations of wood-boring beetles. The temperature of the wood must be maintained at 120 degrees F for at least 30 minutes to kill all of the active stages.

Chemical control

It is possible to treat infestations in unfinished wood with an insecticide (Table 2). Insecticides should be applied as coarse sprays, or with a paintbrush. Make a second application before the first is completely dry. This works out to be approximately 1 gallon of finished solution per 100 square feet of wood surface. Since the insecticide penetrates only the outer surface, this type of treatment is designed to kill adults as they emerge from the wood, rather than the larvae that are feeding within the wood.

Table 1. Characteristics of wood-damaging beetles.

Beetle family	Adult appearance	Wood preferences	Characteristic damage
Lyctidae: true powder-post beetles	<i>Shape:</i> Somewhat flattened, head projecting forward. <i>Size:</i> 3 to 7 mm long. <i>Color:</i> Reddish brown to black.	Hardwoods. Sapwood. Prefer newer lumber. Will reinfest.	<i>Exit holes:</i> 0.8 to 1.6 mm in diameter. Early damage along the grain of the wood but later may reduce entire sapwood to powder. <i>Frass:</i> Fine powder that readily sifts out. No pellets.
Bostrichidae: false powder-post beetles	<i>Shape:</i> Cylindrical, head directed downward, covered by spiny thorax. <i>Size:</i> 3 to 6 mm long. <i>Color:</i> Reddish brown to black.	Hardwoods. Sapwood. Will occasionally attack softwoods. Rarely reinfests.	<i>Exit holes:</i> 3 to 7 mm in diameter. Occasional tunnel going across the grain. <i>Frass:</i> Fine or coarse, which tends to cake. Few, if any, pellets.
Anobiidae: furniture beetles	<i>Shape:</i> Cylindrical, head directed downward and covered by hoodlike thorax. <i>Size:</i> 3 to 7 mm long. <i>Color:</i> Reddish brown to black.	Hardwoods and softwoods. Sapwood. Heartwood. Seasoned wood. Will reinfest.	<i>Exit holes:</i> 1.6 to 3 mm in diameter. More advanced galleries running across the grain. <i>Frass:</i> Contains elongated or bun-shaped pellets.
Cerambycidae: longhorned beetles (old house borer)	<i>Shape:</i> Somewhat flattened, antennae half the length of the body. <i>Size:</i> 16 to 25 mm long. <i>Color:</i> Graying black to brown with two bare spots directly behind head and two white patches on wing covers..	Softwoods. Sapwood. Seasoned wood. Contrary to its name, it prefers newer wood but may be found in old buildings. Will reinfest.	<i>Exit holes:</i> 6 to 10 mm in diameter. Extensive tunnels by larvae that avoid feeding all the way out to the external surfaces. <i>Frass:</i> Powderlike, containing many barrel-shaped pellets
Buprestidae: metallic wood-boring beetles	<i>Shape:</i> Somewhat flattened and boat-shaped, wing covers are usually ridged or roughened. <i>Size:</i> 6 to 25 mm long. <i>Color:</i> Usually dark colored with a metallic sheen.	Hardwoods and softwoods. Sapwood. Heartwood. Unseasoned wood. Will not reinfest.	<i>Exit holes:</i> 2 to 10 mm in diameter. Extensive, flat, winding tunnels, packed with frass. Walls scarred with transverse lines. <i>Frass:</i> Sawdust-like, containing pellets

Table 2. Insecticides for controlling wood-damaging beetles.

Insectide*	Trade name(s)
<i>Nonrestricted-use insecticide</i>	
Disodium octaborate tetrahydrate	Bora-Care Tim-Bor
<i>Restricted-use insecticides</i>	
Cyfluthrin	Tempo
Cypermethrin	Demon TC
Esfenvalerate	Conquer
Permethrin	Prelude

** All chemical information is presented with the understanding that no endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.*

Finished wood can also be treated if you remove the finish, treat the wood as above, and then refinish. If it is not possible or desirable to remove the finish, treat the existing exit holes, open joints and crevices between

boards with an insecticide. A hypodermic needle is useful for slowly injecting diluted insecticide into the exit holes. When treating cracks, crevices and exit holes, repeated applications should be made over a period of several days.

A pest control professional can be helpful in controlling infestations of wood-boring beetles if there is a severe infestation throughout the structure. However, this process is expensive. The pest control operator may be able to place smaller items, such as pieces of furniture, in a fumigation chamber at a more reasonable cost. Fumigants available to the PCO for this purpose include methyl bromide and sulfuryl fluoride.

Warning on the use of chemicals

Before using any chemical, read the label carefully for directions on application procedures, appropriate rate, first aid, storage and disposal. Make sure that the chemical is properly registered for use on the intended pest.

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