

Clemson University Department of Pesticide Regulation

Ants, Beetles, Bees, and Fungi: Other Wood-Destroying Organisms

A Guide for Homeowners and Applicators



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Bulletin 19

In Bulletin 15, "South Carolina Standards for the Control of Subterranean Termites and Other Wood-Destroying Organisms," we discussed control measures for subterranean termites. But, there are other creepy crawlies that can infest a house and turn your happy home into an insect haven. Other wood-destroying organisms include wood-boring beetles, carpenter ants, carpenter bees, and fungi, all of which can threaten the health of houses and other structures.

Beetles

If it's not termites, it's beetles. For this Bulletin, we will discuss beetles as reinfesting or non-reinfesting. Reinfesting beetles include lyctid beetles (true powderpost beetles); anobiid beetles; bostrichid beetles; and old house borers. Non-reinfesting beetles include buprestid beetles; ambrosia beetles; and bark beetles.

Most of the major beetle pests of wood start their destruction by laying eggs in holes, pores, or in cracks on or at the end of wood. After hatching, the tiny grubs will bore into the wood. Thus, the beetle larvae are nearly always found inside the wood. The larvae eat the wood for energy. The larvae will leave a material called *frass* in their tunnels. Frass is loosely defined as the powder that comes out of the south end of a north-bound larvae. As you might expect, the consistency and appearance of frass varies from species to species of beetle.

Beetle Control

The key to wood-boring beetle control is **proper identification**. You must know what species of beetle you're dealing with in order to execute a successful control program. *If you are an applicator, the Department of Pesticide Regulation does not consider "wood borers" as an acceptable term when disclosing an infestation of beetles--you have to specify which species it is.* The next step in controlling wood-boring beetles is determining whether you have an active infestation on your hands. The Rules and Regulations for the Enforcement of the SC Pesticide Control Act provide explicit guidance for determining activity of wood-infesting beetles. If what you see does not meet the criteria set forth in the Regulations, you cannot diagnose an infestation as "active." If you see live beetle larvae or beetle adults, you likely have an active infestation. Active infestations are determined by the following criteria:



Lyctid (powder post) beetle damage.

- **Powder post beetles:** If the frass is "streaming" (stuck to the wood below emergence holes or piled beneath emergence holes), then you have an active infestation. If you have emergence holes without streaming frass or old frass in galleries or protected locations, then you do not have an active infestation.
- **Old house borers:** Streaming frass is not enough evidence to call an old house borer infestation "active." Fortunately, the larvae are relatively easy to collect from the wood. Capturing one is enough evidence to establish an active infestation. Alternatively, larvae make a distinctive gnawing noise (like bacon frying), so hearing the noise would also be enough evidence to determine an active infestation.

There are also a few tricks that you can use to determine if you have an active infestation when things aren't so clear-cut. If you see any new emergence holes, mark the old emergence holes with a pen or spray paint, or cover them with tape. If new holes appear, you have an active infestation. If there's new frass, sweep or vacuum it up. If it reappears, then you likely have an active infestation.

When you have determined that a structure has an active infestation of wood boring beetles, then this four-step control process should be followed:

- Have the species of beetle correctly identified. If unsure, contact your local county extension office for advice.
- If there is a small infestation, the best way to rectify it is to have the infested wood removed and replaced with new wood. Obviously, the infested wood pieces must be destroyed.
- If there is a widespread and accessible infestation (or if removal and replacement is not desirable or practical), chemical treatment is warranted. Thoroughly apply a surface treatment with an appropriately labeled pesticide. Be aware that surface treatments work by interrupting the cycle of re-infestation, rather than immediately killing the insects that are already in the wood. Therefore, it can take several weeks (even up to the complete lifecycle of the pest) to be effective.
- Fumigation is appropriate when the infestation has spread to inaccessible areas, when the infestation is so large that the potential for further damage is unacceptable, or when immediate control is the only option acceptable to the customer. *You must be certified in Category 7B (Fumigation) before beginning any fumigation program in South Carolina.*

Fungi

Wood-decaying fungi can potentially cost homeowners thousands of dollars in repairs. Believe it or not, fungi cause more damage than subterranean termites. There are two kinds of wood-decay fungi and a multitude of surface molds and mildews that are commonly found on the substructure of houses: wood-decay fungi and non-decay fungi. Surface molds begin to grow when wood reaches moisture levels of 20%. While they do not directly cause wood decay, they do allow the wood to retain more water. When wood moisture levels reach 28%, decay fungi become active, and then wood damage occurs. With the one exception of *Poria*, most decay fungi fall into a large group of relatively unknown fungi called "brown cubicle rots."

Since fungi cannot make their own food, that means that they have to get it from somewhere else. In the case of wood decay and non-decay fungi, the food comes from the carbohydrate material found in the cellulose of wood. Microscopic threads of fungi called *hyphae* attack wood. The hyphae secrete an enzyme that decomposes wood, making "food" for the growing fungi. As with insects, fungi require the right environment (food, moisture, temperature, and air) to grow. Wood decay fungi use cellulose from wood as food. (*Lignin* is the part of wood that makes it hard; *cellulose* is what makes it flexible.) The more the fungi that grow and eat, the weaker and weaker the wood becomes.

The non-decay fungi only use sugar and starch material in wood for food; therefore, there is not much wood damage (outside of staining) that is done to wood. Decay fungi can remain "dormant" in wood for long periods of time until the right moisture conditions come along. On a Wood Infestation Report, "excessive" moisture conditions begin at 20%. Active decay begins at 28%.

As you might expect, the southern states are more likely to have fungi problems in houses because of the nearly year long high humidity and moderate temperatures. The best temperature for fungi growth is around 70° to 80° F. They are inactive at cooler temperatures, and they will die if the temperature rises to 105° F or above. Spores, which are fungal "seeds," are how fungi get into houses. They can be airborne spores, or they may be contained in wood that is used for building the house itself. Fungal spores are virtually everywhere.

Surface Staining Molds and Mildews

Sap-staining fungi is also called *bluestain* or *sapstain*. It leaves a bluish stain on wood as it grows. Sap-staining fungi have no effect on the strength of the wood, but the stain is considered a defect in lumber. Sap-staining fungi penetrate the wood deeply, feeding on the starches and sugars stored inside the wood. They will attack both hardwood and softwood. You will see them most often along roof trims, joists, and sub-flooring.

Surface-staining fungi are also referred to as *surface molds* or *mildews*. This fungus will change the aesthetics of wood, leaving a powdery appearance. Like the sap-staining fungi, the surface-staining fungi deeply penetrate wood, feeding on the stored starches and sugars. They attack both hardwoods and softwoods. Although they do not affect the strength of wood, they will greatly affect how porous the wood is. If wood is extremely porous, it will take up and retain more moisture (like a kitchen sponge). More moisture equals more fungi and other pest problems.

Water-Conducting Fungi

Poria is the most destructive of wood-decaying fungi. A water-conducting fungus, *Poria* can literally spread all over a structure and effectively destroy it. *Poria* is sometimes referred to as “dry rot,” but understand there is no such thing as a true “dry rot.” All fungi need moisture to multiply. *Poria* attacks both hardwoods and softwoods, and it eats the starches, sugars, lignin, and cellulose of wood. It will reduce the strength of wood greatly. *Poria* is identified by its thick “fans” and “roots” of hyphae (called *rhizomorphs*). When the infestation reaches huge proportions, the wood will take on the appearance of having hairy brown veins and arteries.

With *Poria*, particular attention must be paid to excessively moist areas. All rhizomorphs should be removed if at all possible. Soil treatments with borates or other fungicides may also be necessary.

Brown rot is also referred to as brown cubicle rot because of the shape and color the wood takes on after being damaged. Brown rot fungi will damage the strength of the wood. It mainly attacks softwoods, consuming stored starches and sugars as well as the cellulose and lignin. Brown rot fungi are the most common of the fungi that attack wood. Moisture is a key player in brown rot fungi growth.

White pocket rot is a fungus that is associated only with living trees. It dies quickly after wood is seasoned. Damaged wood has a pocked appearance, with the pocks containing white fibers. It is found in roof rafters, joists, sills, wood pallets, and shipping crates. No control measures are necessary, because white pocket rot fungi die when the tree is cut.

Fungi Control

The most important part of fungi control is to eliminate the conditions that allow it to prosper! Thus, the more moisture is controlled inside and under houses, the less likely fungi problems will occur.

- The structure should be thoroughly inspected, with special attention paid to the following areas: leaking bathroom fixtures, blistering paint, water stains on rafters, rotting baseboards, and condensation around air conditioners.
- Once it has been established that fungi are the problem, the type of fungus should be properly identified. If you cannot identify it, call your local county extension office for advice.
- Eliminate wood-to-ground contact. Use vapor barriers (such as polyethylene sheeting) under houses over the crawl-space soil. Crawlspace and attic spaces should be properly vented to allow airflow.

It must be noted that the easiest way to get rid of fungi is to *prevent it*. After that, it is better to replace damaged wood with pressure-treated wood. If this is not feasible, then chemical control is warranted. Borate products have shown some promise in controlling fungi, but they are not a substitute for moisture control.

Carpenter Ants

Carpenter ants got their name from the way they hollow out wood for nesting. In South Carolina, there are several species, but only three or four are pests. Carpenter ants *chew* through the wood and *discard* it rather than *eating* it, as termites do. In South Carolina, carpenter ants do not typically cause extensive damage to wooden structures unless the colony is very large and has been present for several years. Homeowners tend to react strongly to the presence of carpenter ants because they are large and conspicuous insects. Carpenter ants frequently forage inside houses in the early evening.



Carpenter Ant Control

Carpenter ant management programs are simple if the nests can be located. It is very important to find all the nests. Attention should be paid to the condition of the structure. This is especially important with carpenter ants because they are often drawn to buildings with certain factors that are favorable to their lifestyle: easy access and wet and/or decaying wood. **Solving moisture problems and keeping branches trimmed away from the house** can be a key in managing carpenter ants. It is difficult to control them by using baits or sprays, although recent Clemson University research does show considerable promise.

Once all of the nests have been located, they should be treated directly with an appropriately labeled pesticide. Sometimes this may involve drilling wall voids and applying dusts, so if you are an applicator, be sure your customer is aware of this. Barrier treatments using microencapsulated formulations, suspension concentrates, and wettable powders may also be effective, but they are a second choice to locating the nests.

Carpenter Bees

Carpenter bees are very active from early spring through summer around houses and other wooden structures. These insects bore one-half inch wide holes that appear to be perfectly round. The holes are found on the exterior surfaces of house siding, window trims, fascia boards, shingles, decks, and outdoor furniture. Homeowners are often afraid of these pesky black bees that fly erratically around their homes. The male carpenter bee is very territorial and protects its nesting site by hovering and buzzing around intruders. Although the male is aggressive, it does not sting. The female has a stinger, but she rarely stings.

Carpenter bees are robust, heavy-bodied bees. The carpenter bee can be identified by their bright yellow, orange, or white hairs in the thorax and bright, shiny abdomen. Carpenter bees are often mistaken for bumblebees because of their similarities in size and appearance. The bumblebee has a hairy abdomen that is black or yellow in color and is much more slender. Although they do resemble each other, they have striking differences: carpenter bees nest in excavated wooden tunnels; bumblebees nest in the ground.



Carpenter bees are nuisance pests in most cases, but they can cause considerable damage from repeated colonization of the same area. Fine sawdust caused by the excavating habits of the adults will usually be found lying on the ground beneath the gallery entrances. Repeated boring activities may result in unsightly stains caused by bee waste falling around the entrance holes.

Carpenter Bee Control

These bees love “raw” wood, but they can also chew into wood that has been stained or treated with borates. The best non-chemical control measure for carpenter bees include keeping wood painted or varnished with polyurethane covers. The paint will make the wood “not feel like wood” to the bee, deterring it from making a nest.

Control of carpenter bees starts with treating each gallery with an appropriately labeled dust, wettable powder, suspension concentrates, microencapsulated, or aerosol insecticide. Control efforts should be conducted in the evening or at night, if possible, because the bees will be inside their tunnels. After 24 hours, all tunnel entrances should be plugged with wood, with a covering of wood putty or caulking. If you are an applicator, try to have your customer do this. If an insecticide is not used in the tunnels, the trapped adult carpenter bees can excavate new openings. In the spring, treating susceptible areas with a fast-acting insecticide can reduce damage.

Checklist for Selecting a Pest Control Company

- ▶ Get several bids, which usually are free, from different Pest Control Operators. While looking at bids, compare not only the “up-front” costs, but also compare the annual fees to maintain the coverage. In comparing companies, inquire about what type of coverage is offered, along with the provisions for transferring the coverage to a new owner if you sell the house.
- ▶ Ask the company for references and check them out. Ask friends and neighbors to recommend a firm.
- ▶ Get a termite contract. Contracts are usually written for five to 10 years. The most useful contracts cover damage, namely treatment and repair.
- ▶ Have your house inspected regularly for termites.
- ▶ A licensed company must place its yellow pesticide sticker, business license number, company name, and location on their company trucks.
- ▶ To learn whether a company is licensed, call the Clemson University Department of Pesticide Regulation at 864.646.2150. To learn about a company’s history, please visit our Enforcement Database at <http://regfocus.clemson.edu/dpr/greenbook.htm>.
- ▶ Call the Clemson University Department of Pesticide Regulation to check whether a company has a history of violations or to file a complaint.

For information about termites and termite control, please see Bulletin 15.