

The Plant Doctor: Biscogniauxia (Hypoxylon) Dieback of Oaks

Biscogniauxia dieback (formerly called Hypoxylon canker or dieback) is a common cause of oak dieback in Mississippi. This disease, caused by either of two fungi, *Biscogniauxia atropunctata* or *B. mediterranea*, is found throughout the United States and is especially common in the South.

All oaks are susceptible to *Biscogniauxia* sp., especially trees in the red oak subgroup. The most frequently and severely affected include black, blackjack, laurel, live, post, southern red, Texas red, water, and white oaks. Although the disease is most common on oaks, other tree species such as maple, hickory, beech, sycamore, basswood, and hornbeam also can be infected.

Biscogniauxia dieback is a disease of stressed trees. The fungus enters the tree through wounds and natural openings in the bark. In healthy trees, the fungus survives in small colonies in the bark and sapwood and is kept in check by the tree's natural defenses. Stresses such as drought, heat, wounds, root damage, toxic chemicals, and other diseases reduce the tree's defenses and give the fungus an advantage. In stressed trees, the fungus is able to grow rapidly and release spores that start new colonies. The fungus is favored by warm (85–95°F), dry conditions. In Mississippi, outbreaks of this disease often are seen a year or two following a significant drought.

The fungus disrupts the flow of water and nutrients through a tree by destroying the plant's nutrient-conducting tissues (sapwood). *Biscogniauxia* sp. is a white rot fungus that decays sapwood by breaking down the cellulose and lignin in the wood. This gives the wood a white coloration and a spongy texture. Strands (hyphae) of the fungus stain the wood black as they grow, causing black lines in the sapwood, referred to as zone lines.

Symptoms of *Biscogniauxia* dieback mimic general water stress and include the following:

- Smaller than normal leaves that make the crown of the tree look thin
- Dead branches
- Yellowing or wilting leaves
- Brown sapwood

Because the symptoms are so generic, diagnosis of *Biscogniauxia* dieback relies on visible signs of the fungus. The fungus forms a cushion-like mat, called a stroma, between the wood and the bark of the tree. Pressure from this cushion causes the bark to peel off in patches or long strips, exposing the stroma. The tan-colored stroma is covered with spores, giving it a powdery look. Over time, the stroma turns silvery-gray and black pimple-like structures appear on its surface. An old stroma often is completely black in color. Stromata are the most obvious sign of this disease and make it easy to identify in the field.

No chemicals are registered for *Biscogniauxia* dieback of oaks. Management centers on preventing the disease and getting rid of infected trees quickly.

Management options include the following:

- Avoid wounding trees.
- Maintain good cultural practices such as fertilizing properly (based on a soil test), preventing or relieving compacted soil, and watering during hot, dry weather.
- Pruning out dead or declining limbs may control the spread of the fungus on a tree, especially if combined with good cultural practices that increase the vigor of the tree and eliminate stresses. Infected wood should be destroyed immediately to keep the fungus from spreading.
- Severely infected trees should be cut and burned. Ideally, the stumps should be destroyed, as well.

Information Sheet 1798 (POD-03-26)

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Produced by Agricultural Communications.

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Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. ANGUS L. CATCHOT JR., Director