31. Hypoxylon Canker of Oaks

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Oaks (*Quercus* spp.) are important in the southern and eastern Great Plains as shade and forest trees. Hypoxylon canker caused by the fungus *Hypoxylon atropunctatum* has become an increasingly important stress-related disease on oaks.

Hosts and Distribution

H. atropunctatum infects most species of oak and has been reported on maple, beech, basswood, and sycamore. Outbreaks of this disease following drought have been reported from Oklahoma, Arkansas, Mississippi, and Florida. In Oklahoma, the disease has been diagnosed from several habitats including forest sites, trees in pastures, recently developed home sites, and established residential areas.

Symptoms and Signs

The most obvious symptom of Hypoxylon canker is the sloughing of bark to expose an effuse silver stroma or cushion of the fungus (fig. 31–1). Information on how this organism attacks and kills trees is limited. It is known that trees that have been stressed or weakened by drought or have had their root systems injured are much more susceptible than healthy trees.

Disease Cycle

The fungus evidently enters branches through wounds, grows through the sapwood, and causes decay. The first symptoms are yellowing and wilting of leaves, and death of top branches of the tree. The fungus is capable of

Figure 31–1. *Hypoxylon atropunctatum* canker on oak showing the effuse silver stroma.

Figure 31–2. Cross section of an infected oak log showing canker formation within the bark.

spreading 3 feet above and below the point of inoculation within one growing season. The fungus may be active in trees for a number of years before symptoms are noticed. It may kill trees that are weakened or injured.

The disease develops through branches, causing progressive dieback. Later, the outer bark is sloughed (fig. 31–2), exposing a thin stroma. Initially the stroma bears brownish, dusty masses of one-celled conidia, which are easily blown from tree to tree and cause new infections (fig. 31–3). The stroma quickly changes to silver and later to black, and becomes thicker and harder as the sexual stage of the fungus develops (fig. 31–4). Inside the stroma, the sexual stage produces fruiting bodies (perithecia) in which masses of dark spores are formed. Spores ooze out of the perithecia onto the surface of the stroma, where they can be spread by various means (rain, insects) to other branches or trees. Large trees may be killed within 1 or 2 years, depending on the health of the tree. Because initial stages of the disease may go unnoticed, however, trees may appear to die within a period of a few weeks. Stromata may be limited in their development, or extend the length of the tree.

Damage

Reports from Arkansas and Oklahoma indicate that the red and black oaks are more susceptible to Hypoxylon canker than are the white oaks. Canker formation is also more effuse on red and black oaks. Cankers were found on 65–95 percent of the dead oaks observed in two surveys in Arkansas. Measured and potential losses of gross volume of red oak in Arkansas were estimated at 7.1 percent of total volume.

Figure 31–3. Young dusty brown colored canker composed of conidia of the asexual stage.

Figure 31–4. Close up of an older stroma of *H. atropunctatum* on an oak stump.

Control

There is no effective control for this disease. In commercial operations where trees can be harvested for pulp, trees should be cut before decay reduces their value.

In urban areas, trees with more than 15 percent of the crown area infected should be cut to ground level and burned. No stump should be left because, in several instances in Oklahoma, stroma have developed on stumps with as little as 6 inches exposed above the ground (fig. 31–4). Trees with less damage should be given extra care, such as watering during drought, and fertilization. Because the fungus remains active on dead wood, fuel wood should be burned as soon as possible to prevent further sporulation and spread of this disease. In addition, all dead branches should be pruned from the tree and destroyed. The best defense against this disease is to maintain trees in a healthy, vigorous growing condition.

Selected References

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