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OKLAHOMA COOPERATIVE EXTENSION SERVICE

Hypoxylon Canker of Oaks

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One of the greatest losses that a homeowner can experience is the loss of a tree. Not only is a tree an aesthetic part of the yard but it also provides shade for the homeowner as well as shelter for birds and other animals. Trees in the landscape are often focal points for the entire family to enjoy the wonders of nature. Therefore, it is tragic that, although it takes years for a tree to develop, it requires only a short period of time for a disease or diseases to kill it. Such is the case with hypoxylon canker of oaks.

Occurrence

Although there were early records of hypoxylon canker of oaks in Oklahoma, not much attention was given to its potential until the spring of 1979. Reports on the seriousness of this disease were first received from Pushmataha County in southeastern Oklahoma. A survey of several counties, as well as specimens received in the Plant Disease Diagnostic Laboratory, disclosed that the disease was very active in at least 14 counties in the eastern and central portions of the state.

The hypoxylon canker fungus infects most species of oaks in many states and has been diagnosed from several habitats, including forest sites, trees in pastures, recently developed home sites, and established residential areas. In one case in Oklahoma, the severity of the disease eliminated 15 acres of established oak trees surrounding a recently built home. In another case, it eliminated six acres of oaks in the central area of a condominium development.

Disease Cycle

The causal organism of oak hypoxylon canker is a fungus, Hypoxylon atropunctatum. Unfortunately, little is known about how this organism attacks and kills trees. However, it is known that trees that have been stressed or weakened by drought or have had their root systems injured are much more susceptible to this disease than healthy trees.

Research reports indicate that the organism enters branches through wounds. The fungus then grows through the wounds, then through the sapwood causing decay. The first outward symptoms that may be evident are yellowing and wilting of leaves and death of top branches. Inoculation experiments in Georgia have shown that the fungus is capable of spreading up to 3 feet above and below a point of inoculation within one growing season. Researchers at the University of Arkansas have been able to isolate the fungus from seedling oak trees which showed no symptoms of infection. This would indicate that the fungus may be active in the trees for a number of years before disease symptoms are noticed. When trees are weakened, particularly by drought, or injured, the disease is capable of overcoming resistance of the host, and the tree dies.

The disease progresses through branches, causing dieback symptoms. After the death of branches or of the tree, the outer bark sloughs off, exposing a thin stroma (a mass or mat of fungal hyphae packed together to form a hard crust in or on which spores are formed). At first the stroma produces brownish, dusty masses of conidia (asexual fungus spores) that are easily blown from tree to tree and which cause new infections. The stroma color soon changes to silver and then to black as the sexual state of the fungus develops (Figure 1). The stroma becomes thicker and harder as the sexual state develops. The sexual state produces masses of dark spores inside the stroma, which are “oozed” out onto the surface, where they can be transferred by various means (rain, insects, etc.) to other branches or trees. A large tree may be killed within one to two years, depending on the vigor of the tree; however, because early stages of the disease may not be noticed, trees may appear to die within a period of a few weeks. A stroma may be limited in its development or may extend the entire length of the tree (Figure 2).

Control

There is no effective control for this disease, which is due in part to lack of recognition of the early stages of infection. In a commercial operation, where trees can be harvested for pulp, it is recommended that trees be cut before decay reduces their value.

In a home setting, individual trees that have more than 15% of the crown area infected should be cut to ground level and burned. No stump should be left because stroma development has been observed even on very small stumps. Trees with less damage should be given extra care, such as watering during periods of drought, providing adequate fertilization and preventing damage to trunks or roots. Homeowners should be aware that the fungus remains active on dead wood. Therefore, if the wood is to be used as fuel, it should be burned as soon as possible to prevent further spore production and subsequent spread of disease. In addition, all dead

Figure 1. Close-up of hypoxylon diseased oak showing the light-colored stroma beneath the bark.

Figure 2. Hypoxylon canker extending the entire height of a tree.

branches should be removed and destroyed. The best defense against this disease is to maintain trees in a healthy, vigorous growing condition by adequate fertilization and by providing adequate water year round.

Hypoxylon Cankers of Other Trees

In addition to hypoxylon canker of oak trees, there are hypoxylon cankers of certain other trees. While most of these canker diseases have been reported only in other states, some are found in nearby states and are of interest because they may eventually be introduced into Oklahoma. Two of these are mentioned below.

The causal fungus of hypoxylon canker on oak, *H. atropunctatum*, present in Oklahoma, has also been found on hickory trees in Georgia and on pecan trees in Texas.

H. tinctor has been reported to cause cankers on both the American sycamore (*Platanus occidentalis*) and on the London plane tree (*P. acerifolia*) in North Carolina, Georgia and Louisiana. The cankers are sunken with indistinct margins and have longitudinal cracks. Bark in the cankered area turns orange.

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