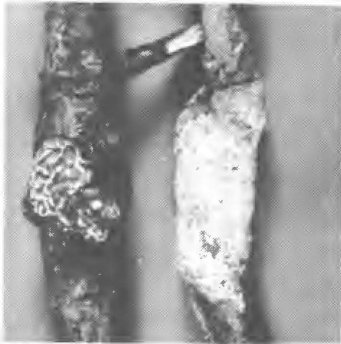


Forest Tree Diseases of Virginia

September 1973

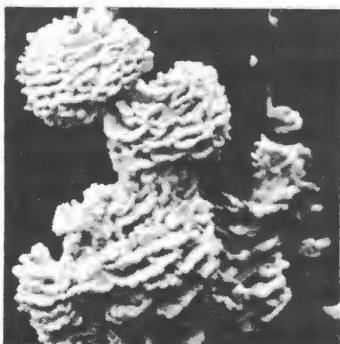
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RUST



DECLINE



DECAY



CANKER

Canker Diseases of Oak

by

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Among the diseases of oak, cankers are often the most conspicuous and easily identified. These fungus-caused lesions of the bark and of the cambium (growing layer of cells) cause trees to produce grotesque layers of callus tissue while attempting to heal the infected areas. Resultant malformations seriously degrade tree value. In most instances canker diseases of forest trees are of little economic importance. However, early recognition and prompt control can reduce future damage to high value stands of oak and better utilization of the growing site will result.

Figure 1. An oak stem exhibiting a very old canker caused by Strumella coryneoidea. Infection took place through the dead branch stub and advanced outwardly during future years killing the callus tissue laid down by tree. Such cankers destroy the value of infected trees for any high quality use.





Figure 2. Tree broken by wind at weakened point caused by canker and associated decay.



Figure 3. Large, brown cup-shaped fruiting structures of the causal fungus produced along the edge of a fallen tree.

A recent survey by the United States Forest Service, Division of Forest Pest Control and the Virginia Division of Forestry indicated that canker diseases of oak may be more prevalent than previously suspected. Eleven percent of 225 trees sampled in 12 plots had either *Strumella* or *Hispidus* cankers. In addition, another 14 percent of the oaks displayed stem defects indicating interior decay. They noted that 25 percent of the 225 oaks examined were therefore not merchantable by present sawlog standards.

Strumella canker: This deformation caused by the fungus *Strumella coryneoidea* is found throughout oak stands in Virginia. It may be of considerable economic importance in high value oak stands in that infections usually occur on the lower 12 feet of the main stem. The causal fungus apparently enters through dead branch stems.

Range: *Strumella* canker is found affecting oak stands throughout the Northeast but it is seldom found south of Virginia.

Symptoms and Signs: Cankers are fluted and usually extend 2-3 feet in length but may be up to 10-12 feet long (Figure 1). Annual callus folds are usually conspicuous on the canker surface and it is possible to determine the age of cankers by counting these folds. The bark characteristically remains on the canker surface. The wood behind the canker surface may be decayed by *S. coryneoidea* or by numerous other decay organisms. When decay does occur at the point of cankering, wind breakage is common (Figure 2).

The fungus forms blackish brown fruiting structures about the size of a pinhead around the periphery of the canker. After the death and fall of infected trees, large, brown colored cup-shaped fruiting structures about 1-2 inches in width are formed along the edge of the stem near the cankered area (Figure 3). Spores from these structures may cause new infection on other trees in the stand.

Suscepts: Trees are seldom attacked before reaching 25 years. Red, black, and scarlet oaks are more susceptible.

Control: Early recognition and removal of cankered stems in high quality stands is suggested. However, complete eradication of this disease from a stand is virtually impossible. Removal of cankered trees from the stand will reduce new infections by preventing the formation of the fungus structures and the spore stages that cause new infections.

Hispidus canker: The fungus Polyporus hispidus is one of several decay fungi with this "canker rot" capability, this fungus is of most concern throughout the oak stands of Virginia. It is of particular importance in the southwestern counties of the state.

Range: Hispidus canker may be found in oak stands throughout the United States but is more prevalent in forests east of the Mississippi River.

Symptoms and Signs: This canker disease is usually characterized by elongate sunken areas extending several or more feet along the stem of infected trees. The sunken areas may be very inconspicuous and unless fruiting structures of the causal fungus P. hispidus are present (Figure 4), cankered trees may be overlooked by the causal observer (Figure 3).

The bark on smaller stems usually remains in place over the canker surface for many years but on larger trees with older cankers a very rough, elongate canker may be in evidence.

The causal fungus is primarily a heartwood decay-causing organism. Its spores infect wounds or dead branch stubs and the fungus grows into the heartwood. Following invasion of the center of the tree, the sapwood is attacked and eventually the growing layer of cells (cambium) is killed and a canker results.

The fungus produces yellowish-brown fruiting bodies similar to those produced by many other wood decaying fungi. These conks or sporophores are shelf-like in appearance and may be one to several inches in width and thickness. They are produced directly on the canker surface each year and fall from the tree during the late fall and winter. Often, these conks may be found at the base of infected trees, thus indicating that an otherwise inconspicuous canker may be present.

The decayed wood behind the canker surface is usually golden brown in color and has the consistency of pressed sawdust (Figure 5).

Suscepts: Many species of oak and several other hardwood species are susceptible. In Virginia, white and chestnut oak are most often attacked but scarlet and other red oaks are susceptible.

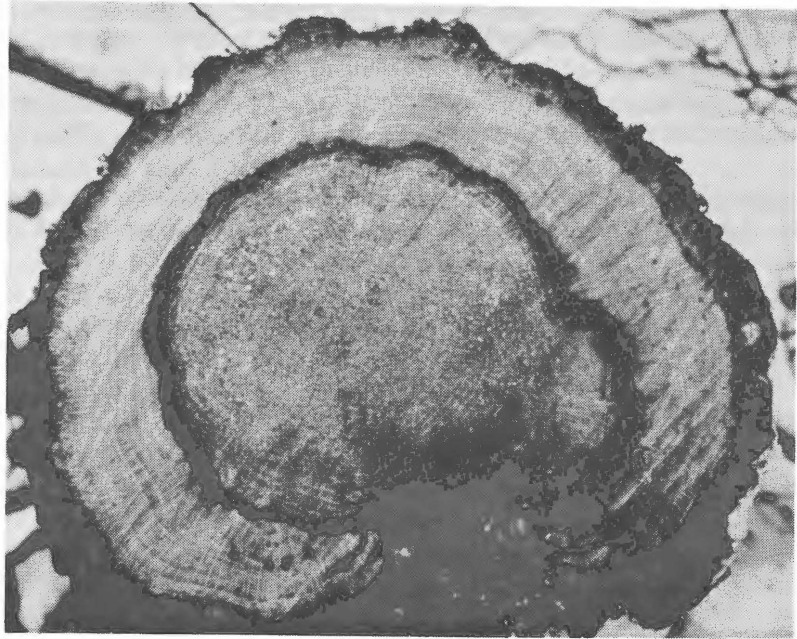
Control: Removal of infected trees during timber stand improvement cuts will reduce later losses by the elimination of cull trees and also a reduction of the spread of the fungus will result through fewer fruiting bodies being produced. Care must be taken during logging operations to prevent wounds or broken branches in the residual stand.

Although some variation of opinion exists as to loss factors, recent studies in Virginia indicate that the average length of the decay column (7.9 feet) was four times the average length of the canker surface (2.0 feet).



Figure 4. Conk of Polyporus hispidus indicating presence of canker and decay within otherwise non-symptomatic oak

Figure 5. Internal decay caused by Polyporus hispidus in chestnut oak. The texture of the decayed wood is like sawdust. Note the dark zone line forward between healthy and decayed wood.



Fallen infected trees should be removed from the stand as the fungus will continue to fruit on the canker surface or exposed log ends for several years.

Twig Cankers: Several species of fungi cause twig cankers similar to the damage typical of the periodic cicada activity.

Range: Twig blight is common throughout the Appalachian Mountains of the Eastern United States.

Symptoms and Signs: Canker development, foliar blight, and twig and branch dieback follow infection by the causal fungi. Leaves on infected twigs turn a very light brown and often the twig snaps at the point of cankering but remains attached to the tree in a pendant position. Such "flagging" is the most typical symptom of this disease. Often, small black fruiting bodies of the causal fungi are present on the canker surface.

Suspects: Chestnut oak appears to be the most susceptible to attack by these fungi. Other oaks may be moderately attacked under various conditions.

Control: Control is not economically feasible. Growth reduction or serious branch dieback may result in significant growth reductions in affected trees. Severely infected trees should be removed from the stand during timber stand improvement thinnings.