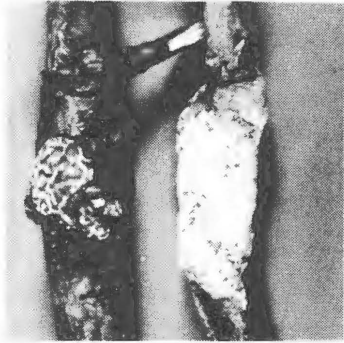


Forest Tree Diseases of Virginia

September 1973

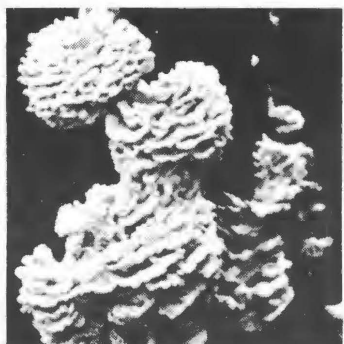
MR-FTD-12



RUST



DECLINE



DECAY



CANKER

Heartrot Caused by

Fomes pini

by

John M. Skelly

Extension Specialist, Plant Pathology

Virginia Polytechnic Institute and State University

Blacksburg, Virginia

Of the loss due to disease in the forest, wood decay accounts for 75 percent of the total. Most often, older, overmature trees are attacked, but substantial heartwood decay of younger trees exists in Virginia's forest. In living trees, the older tissues of the heartwood are most susceptible to the decay-causing fungi and only occasionally is the sapwood attacked. Conifers, due to the abundance of heartwood, are extremely susceptible to many species of heartrot-causing fungi. The most important of these is Fomes pini, the causal fungus of red ring rot. This disease is also known as white pocket rot, red heart, ring scale, honeycomb, white speck, conk rot or pecky rot. In the United States, losses due to red ring rot far exceed those from any other decay.

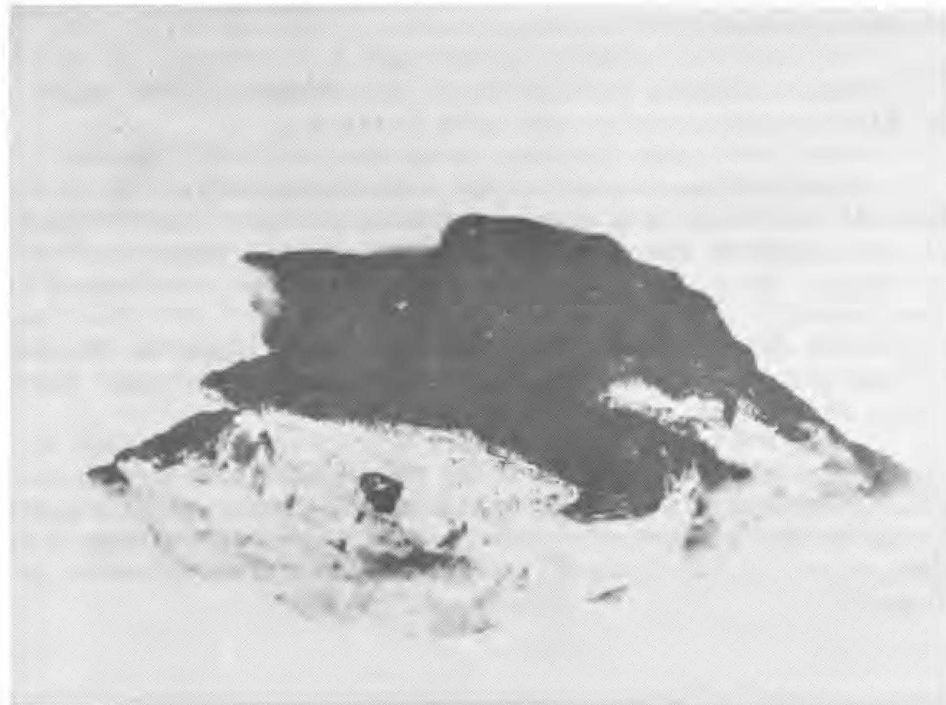


Figure 1. Sporophore of Fomes pini illustrating rough and irregular appearance

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. W. E. Skelton, Dean, Extension Division, Cooperative Extension Service, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

In Virginia a 1930 study demonstrated that of 867 loblolly and short-leaf pine trees studied, 11 percent contained F. pini. As in other areas of the United States, the older the tree the more likely it is to be infected. Only 5.4 percent of loblolly pines 40-90 years old had decay whereas 72 percent of trees 190-230 years old had been infected. Since 1930 many of the older stands in Virginia have been logged, and with increased utilization of older stands, losses due to this decay fungus will be reduced.

Range: Fomes pini is found throughout the United States. It occurs sporadically in Virginia and tends to be of economic importance in various sections of Virginia.

Suscepts: Most of the conifer species found in North America are susceptible to infection by F. pini. All three of the major pine species in the state (Loblolly, Shortleaf and Virginia) are attacked by this fungus to an economically significant extent in some stands. In addition, severe infection of eastern white pine has been recorded.

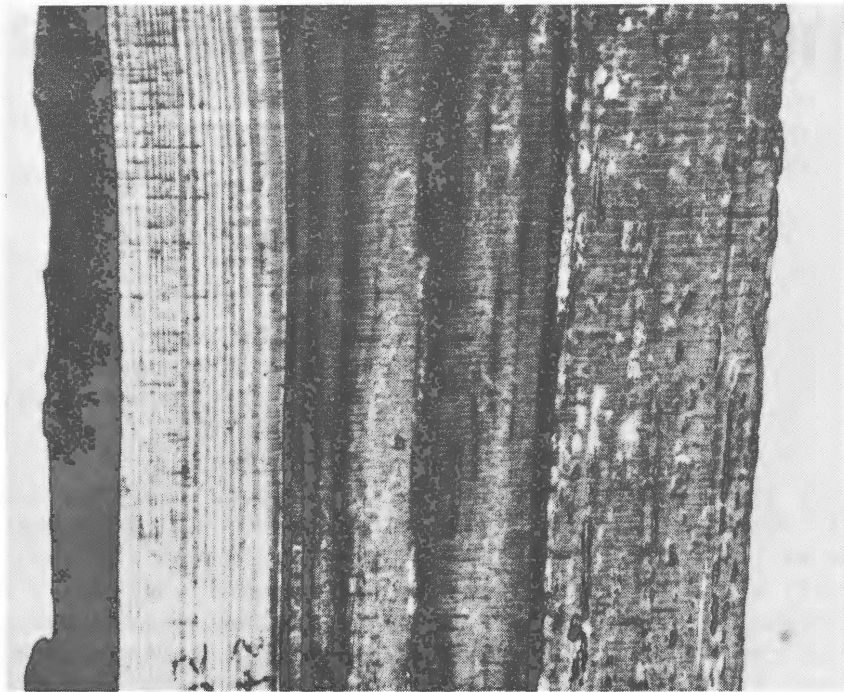
Symptoms and Signs: The most obvious indicator of internal decay in standing trees is the presence of a fungus fruiting structure called a conk or sporophore (Figure 1). The sporophores of F. pini are very irregular in shape but characteristically they are 4-8 inches in width and have a very rough, cracked, and zonate upper surface (Figure 1). The upper surface is brownish black and the lower surface is uniformly brown in color. The pore surface (lower) consists of winding, angular pores which are distinct to the unaided eye. When a conk is actively growing, the outer edge is rusty brown and velvety in appearance. Conks found on different host species may be so dissimilar that they would not be recognized as both being those of F. pini. Most often, conks are found near wounded surfaces, knots, or branch stubs on living trees but may occur directly on healthy bark. Active conks may be found anywhere on dead trees or fallen logs.

Other external indicators of decay are swollen knots, heavy resin flow, or flat sunken areas on the bark surface.

Infected heartwood is initially characterized by a discoloration of the normal heartwood to a deeper red-purple color, hence the name "red ring rot". An abundance of resin may be present and the wood is firm during initial stages of decay. As F. pini continues to attack the wood, many elongate white pockets that contain cellulose are formed (Figure 2). In cross section these pockets appear as white specks. Wood in advanced stages of decay may contain many hollow pockets and the wood may be cracked into small squares particularly along the annual rings.

Control: Except for using sound management and careful logging practices, control of decay organisms is virtually impossible in the forest situation. Early recognition of the presence of Fomes pini within a stand, and proper management of such stands, affords the best opportunity to reduce economic losses.

Figure 2. Result of advanced attack of Fomes pini. Note white elongate pockets that contain residual cellulose after fungal utilization of other wood contents



Stands should be harvested at the point of "economic maturity" and should not be left until overage and decadence begins. Infected trees found in younger stands should be removed during thinning or selective logging operations to eliminate the production of conks and hence reduce the capabilities of the fungus to spread. Care should be taken to examine suspect trees in case conks are not present on the surface. After a certain period, the amount of wood lost due to decay is greater than that being produced and the tree becomes of decreasing value in the stand.

Cull factors for standing trees are extremely variable dependent upon the species attacked. One study in Virginia demonstrated that on loblolly pine the decay column behind a single fruiting body may be 35 feet above and 55 feet below the conk. The average total length of decay columns was, however, 50 feet on the 15 trees examined.

If fruiting bodies are present at several locations on the bole, the entire tree is worthless for timber and should be eliminated from the stand.

Numerous obviously infected trees within a stand may indicate a high incidence of infection in trees not exhibiting symptoms. Careful observations of the entire stand should be made and an estimation made of the progress of the decay. Harvests can then be timed to precede the advance of serious decay losses.