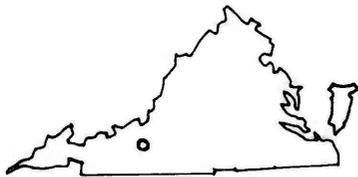
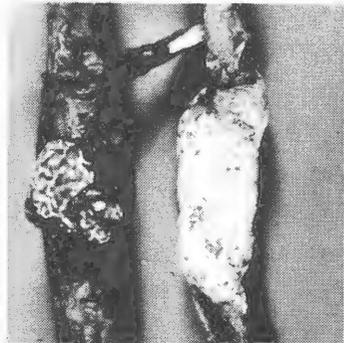


# Forest Tree Diseases of Virginia



September 1973

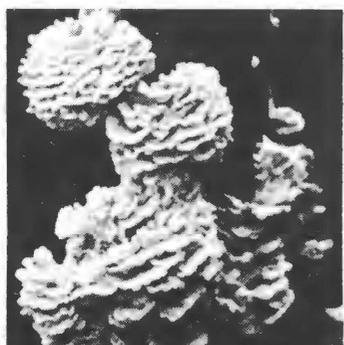
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**RUST**



**DECLINE**



**DECAY**



**CANKER**

Shoe String Root Rot

by

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One of the most inconspicuous and underestimated fungal pathogens of forest trees is Armillaria mellea. This commonly occurring fungus causes a root rot of most major tree species in Virginia, particularly hardwoods. The fungus produces dark



Figure 1. Advanced stages of decline caused by a complex of causes. Armillaria mellea infection of the root system plays a significant role in the death of such affected trees.

"shoestring" like masses of fungal mycelium called rhizomorphs beneath the bark of infected trees; hence the name "shoestring fungus". The fruiting structure of the fungus is a mushroom and A. mellea is known as the "honey mushroom" due to its color.

Although Armillaria mellea has been reported attacking healthy trees, it generally thrives on dead and dying roots, having the capacity to attack trees weakened by other agents. Such weakening may be due to drought, frost, insect defoliation or poor soil conditions. Since such predisposing conditions commonly occur, A. mellea can be of considerable importance in the final death of weakened trees. As a result of the killing of fine feeder roots by this fungus, serious radial and terminal growth reduction of affected trees may occur. The fungus is also responsible for butt rot in some species of trees.

Armillaria mellea has been identified as having a significant secondary role in disease complexes such as oak decline, maple blight, ash dieback and various citrus tree declines.

Range: Armillaria mellea is a commonly occurring soil fungus of worldwide distribution. It is frequently found in the forests of Virginia either under the bark of dead standing trees, on fallen logs or stumps. It is a common fungus found on the roots of oak, hickory, yellow poplar and other valuable hardwoods.

Symptoms and Signs: The activity of root-rotting fungi is expressed initially at the apex of the tree crown or in a general decline in vigor of the entire tree (Figure 1). Premature leaf coloration; yellowing of foliage and twig, branch, and main stem dieback are successive symptoms of attack. As decline progresses, decay of buttress roots and the lower trunk is usually evident. Diseased trees may be found scattered throughout the stand or infection centers,

Figure 2.  
Rhizomorphs of  
Armillaria mellea.  
Note shoestring  
like appearance  
of these fungus  
strands. Net-  
works such as this  
are commonly  
found under the  
bark at the base  
of infected trees  
or under the bark  
of larger roots.

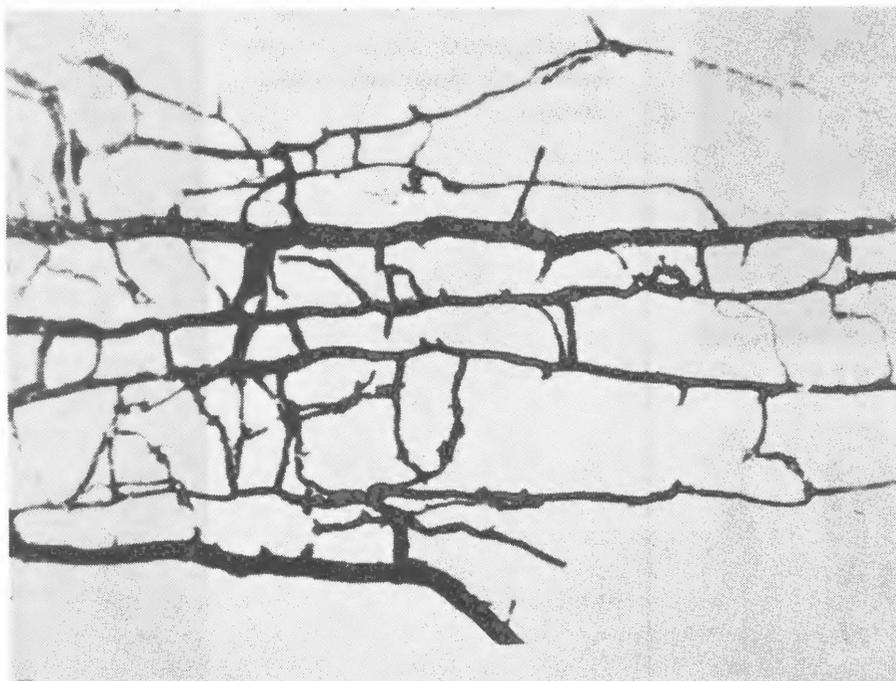


Figure 3. Mushrooms of Armillaria mellea collected from the base of an infected tree during the fall of the year. These mushrooms are honey colored when fresh and are from 3 to 10 inches tall with caps measuring one to several inches in diameter.



composed of several declining trees may be found. Since the fungus is present in most forest soils, a general decline may occur over several thousand acres after trees are predisposed by some other agent to attack by A. mellea.

The signs of the attacking fungus are seldom seen before severe decline has occurred. If affected roots of such trees are examined, white fans of fungal growth will be found on and under the bark. Later, dark shoestring like masses of fungus mycelium called rhizomorphs may be found (Figure 2). These black-brown rhizomorphs may be found on or under the bark of infected roots and lower stems. Rhizomorphs are also found growing out from roots into the soil and can be mistaken for tree roots but can be distinguished from such roots by the absence of a central woody core. New infections occur when these rhizomorphs come in contact with other roots and penetrate the unbroken bark. During wet periods of the fall of the year the honey-colored mushrooms of the causal fungus appear late in the decline stages. They develop in clusters at the base of the tree. Mushrooms range in size from 3-10 inches in height and the cap is usually less than one to several inches in diameter (Figure 3). The lower surface is light brown to white in color with radiating gills. Spores that drop from these mushrooms are capable of causing new infections when they are deposited on open wounds.

Control: Armillaria mellea has been reported to attack only trees that have been predisposed to a condition that initiates low tree vigor. Practices that keep stand vigor and growth at an optimum level will reduce the chance of heavy attack by this fungus. Since this fungus is involved in several decline complexes, the control recommendation of salvaging severely declining stands would apply to this disease.