

# Forest Tree Diseases of Virginia

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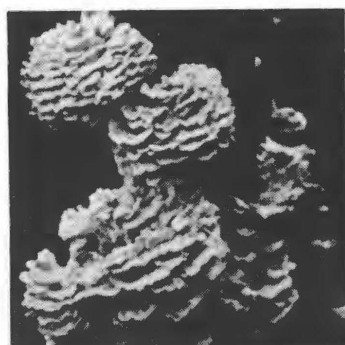
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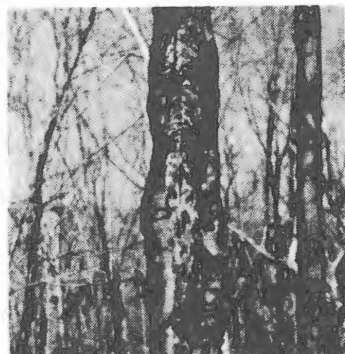
**RUST**



**DECLINE**



**DECAY**



**CANKER**

## Leaf Diseases of Hardwood

by

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Leaf diseases of hardwood trees in the forest situation are usually not thought to be of any significant importance. Most tree species produce an overabundance of leaves far exceeding that required for normal growth. Therefore, unless severe defoliation occurs, enough leaf surface is usually left to produce a normal annual growth increment. When all or most of the leaves are lost due to the effects of disease or other injurious agents, poor vigor, growth loss and in a few cases even death has followed. Early summer refoliation will immediately cause growth loss and may eventually cause severe decline of affected trees through the depletion of food reserves that are used in the production of a second flush of leaves each year.

Most leaf disease causing organisms are favored by cool wet weather at the time of leaf development in the early spring. Only a few diseases develop late in the summer months when the weather is hot and dry.

The impact of leaf diseases will increase significantly when more intensive management of hardwood stands is begun, such as with "silage sycamore stands". Growth losses in such stands will seriously hamper the objective of rapid growth and short rotations for pulpwood production.

## ANTHRACNOSE

Leaf and twig blight commonly called anthracnose occurs on many plant species. Hardwood trees are no exception and in some instances, such as in sycamore or walnut stands, anthracnose poses a threat to production. Anthracnose is caused by several species of fungi in the genus *Gnomonia*. Disease development is favored by cool wet weather in the early spring. Severely affected trees are more susceptible to insect attacks, root rot organisms, and winter injury.

Range: This disease is prevalent in all sections of Virginia but is usually only of importance in small areas during any

particular year. It is found throughout the United States but it is of concern primarily in the eastern and central hardwood forests.

Suscepts: Most hardwood trees are susceptible to infection by the causal fungi. Sycamore, walnut, oak, and maple are most severely affected with complete defoliation of the first two occurring quite commonly. Less affected are hickory, ash, and several species of minor importance. Horsechestnut may also be severely affected.

Symptoms: Severe infection of leaves causes defoliation to occur during late spring and early summer. In some instances only the top of the crown remains unaffected, giving the tree a very tufted appearance. Refoliation of affected trees usually is poor and very thin crown results.



Figure 1. Dead areas along the veins of sycamore leaf. Such areas are very brittle and often black fruiting bodies of the casual agent are visible. Small stem canker is at right.

Anthrachnose is characterized by very sharply defined areas of dead tissue on affected leaves. These areas are usually found in association with veins on the leaf but in severe cases death of an entire portion of a leaf may occur (Figure 1). If young developing leaves are infected, they may become distorted due to the continued growth of noninfected tissues about the periphery of infected-dying areas on the leaf.

Sycamores, in particular, are susceptible to the advance of the fungus into small twigs where it causes cankers to develop. These twig infections may remain active for several years and eventually the terminal portions of the affected twigs die (Figure 1).

Anthrachnose of walnut is evidenced by smaller spots that are black in color with very irregular borders. In addition, the walnut fruit may be attacked with very similar symptoms resulting. Premature defoliation of leaves and nut drop will occur in cases of severe infection. Nut quality will be reduced by darker color and shriveled or dry meat production. Cankers also develop quite commonly on affected twigs. Small, dark colored fruiting bodies of the causal fungi may be produced on the infected tissues, but these are inconspicuous to the casual observer.

Control: In most cases, control of anthracnose diseases is not economically feasible under forest conditions. However, in areas such as sycamore silage

stands or in walnut groves planted for veneer or other high quality products, chemical control is possible and feasible. Protective fungicides such as zineb or maneb 75% WP (2 lb/100 gal. = 1-1/2 tbsp./gal.) should be used during cool and wet weather in the early spring. The first sprays should be applied at 1/2 leaf development and then two or three additional applications should be made at 2 week intervals thereafter. Sanitation should be practiced with fallen leaves and dead twigs being removed and burned or buried. In some areas where losses are severe, resistant tree species should be favored, i.e., black or red oak instead of white oak or sycamore.



Figure 2. Oak leaves moderately affected with oak leaf blister. Spots are usually circular and appear as raised areas on the upper leaf surface.

#### LEAF BLISTER OF OAK AND OTHER SPECIES

Although species of the red oak group are highly resistant to the anthracnose causing fungi, they are considered to be very susceptible to the fungus that causes oak leaf blister, Taphrina coerulescens. This is a major leaf disease of oak in the southern United States and it occasionally will cause 50-85% defoliation of affected trees by mid-summer. Such defoliations cause growth reduction and may weaken the trees' resistance to attack by other agents. This disease is also favored by cool and wet weather in the spring.

Range: Leaf blister occurs throughout the United States but is important on oak only in the eastern section of the country with highest importance in the South. A similar disease occurs on peach trees in the Lake States where it is considered to be one of the most important diseases of commercial peach orchards.

Suspects: Oak is the most susceptible southern forest tree species with black and red oak being the more susceptible to attack. Other species affected occasionally include poplar, birch, cherry, plum, pear and peach.

Symptoms: Leaf blister is characterized by raised, wrinkled, and brown blisters on affected leaves during late summer or early fall (Figure 2). Initial symptoms involve a slight yellowing of the infected tissues. Blisters are formed as a result of the fungus stimulating cell growth after surrounding infected cells

have become rigid. These blisters are usually less than one inch in diameter and they remain light green in color for several weeks before death of tissues results in a brown coloration. Leaf distortion occurs in cases of severe infection with many blisters being formed on a single leaf. Premature leaf fall may occur in the early fall.

Control: There is no economical control for this disease in the forest situation. Severely affected and dying stands should be replanted or converted to more resistant tree species.

#### POWDERY MILDEW

Powdery mildew occurs on many forest tree species but it has never been considered to be of any significance in the United States. It can be recognized by the powdery white mycelium of the causal fungus and numerous black fruiting bodies found on the lower leaf surface. This disease is prominent during dry weather conditions from spring until leaf drop in the fall.

Control: No control is feasible under forest conditions.

#### TAR SPOT OF MAPLE

Another commonly found but also non-economically important disease is tar spot of maple. This disease is easily diagnosed by the presence of large black raised spots that occur on the upper surface of infected leaves.

Control: No control is feasible under forest conditions.

#### OTHER LEAF DISEASES

Several leaf spots, rusts, and physiological disorders of leaves of forest trees are not included in this publication due to their minor importance in Virginia. Additional information on several of these is available through textbooks on forest pathology or through the Extension Division at Virginia Polytechnic Institute and State University, Blacksburg.

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#### KEYS TO PROPER USE OF PESTICIDES

1. Read the label on each pesticide container before each use. Follow instructions to the letter; heed all cautions and warnings, and note precautions about residues.
2. Keep pesticides in the containers in which you bought them. Put them where children or animals cannot get to them, preferably under lock and away from food, feed, seed, or other material that may become harmful if contaminated.
3. Dispose of empty containers in the manner specified on the label. If disposal instructions are not printed on the label, burn the containers where smoke will not be a hazard, or bury them at least 18" deep in a place where water supplies will not be contaminated.