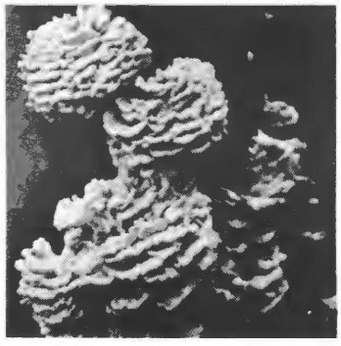
Forest Tree Diseases of Virginia

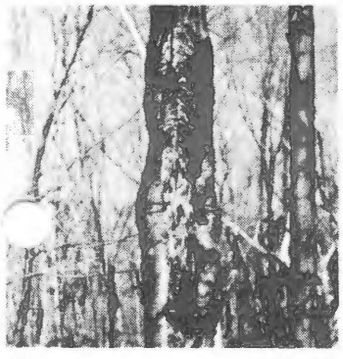
April 1977 MR-FTD-27

RUST

DECLINE



DECAY



CANKER

Brown Spot Needle Blight of Conifers

by
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Brown spot needle blight is a very serious disease of several important forest trees. It is best known for its impact on longleaf pine production in the southern United States. It also is considered to be a very serious disease of Christmas trees. Brown spot threatens Christmas tree production over a very wide range with several plantations being damaged in Virginia. This is the type of disease which can devastate a highly productive plantation in a relatively short period of time unless proper control measures are initiated promptly after the disease is recognized to be present. In the past ten years, brown spot needle blight has reached epidemic proportions in Scotch pine Christmas tree plantations in the north-central States with several hundred thousand Scotch pine trees being lost over 3000 acres of plantation that exist in that region. The disease is particularly severe on short-needled Scotch pine varieties. Brown spot is expressed very dramatically in infected trees with even casual observation of the various plantings bringing it to the growers attention. This disease is not considered to be important on any commercial timber species in Virginia.

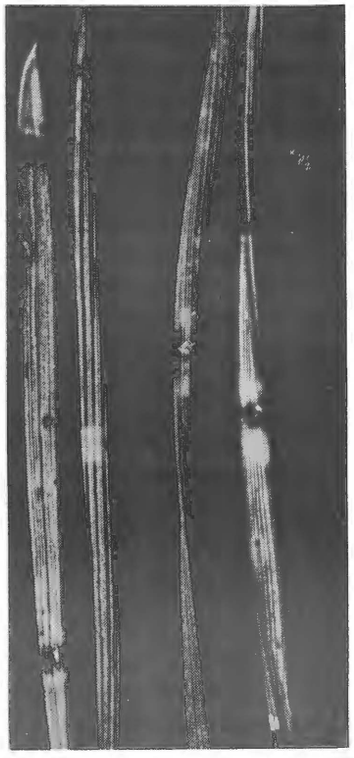

Figure 1. Brown spot lesions. Note: shiny resin droplet on 2 left needles and yellow spot (light colored area) on 3rd needle from left. Each is evidence of infection.

Range:

Brown spot needle blight has been observed in most of the pine growing

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regions of the United States and southern Canada. It is of economic importance only in the South, north to Pennsylvania, and west into the North-central States.

Cause:

Brown spot needle blight is caused by the fungus Scirrhia acicola. This fungus is a member of the class Ascomycete and it produces two fruiting or spore stages. The conidial (asexual) stage is the most common means of dissemination of the fungus particularly in the northern States. The sexual stage is only important in the South.

Suscepts:

Brown spot needle blight may cause damage on many conifers but it is most important on longleaf, Scotch, Austrian and red pines. The most susceptible Scotch pine varieties are Spanish and French-green followed by Austrian Hills and German. Eastern white pine is highly to moderately resistant.

Symptoms and Disease Cycle:

Susceptible pine needles may be infected by the fungus during the spring, summer or early fall whenever the correct environmental conditions are present. Small, irregular circular spots of a light green to yellow color first appear on the needles. These spots then become brown in the center with yellow margins and may be resin-soaked. A small droplet of exuded resin on such a spot is a very useful field diagnostic tool. Later these brown spots may encircle the needle producing a banding effect (Figure 1).

Once established, the fungus spreads rapidly by means of asexual spores called conidia. The are produced in black fruiting bodies which are found on the brown or dead parts of the needles. These fruiting bodies are slightly protruding when wet and flush with the needle surface when dry. Spores are released during periods of precipitation and disseminated by wind-blown rain. The current-year needles must be wet for infection to occur with a maximum germination temperature of 76°F for conidia. Field observations have indicated that as Scotch pine needles mature they become more resistant to infection. Infections occurring in late summer and early fall usually do not result in spore production until the following spring.

Infected pine needles turn brown in the fall. The disease is most severe in the lower part of the tree and especially so on the north side of the tree. Infected needles

Figure 2. Brown spot needle blight infection of Austrian Pine. Total devastation of plantings such as this can occur in as little as three years. Note death of lower branches.

begin falling off in the late fall and continue until most of the infected needles have been cast (Figure 2). Some needles may not drop until the next spring. Moderate to severe defoliation results in the loss of 1-and 2-year-old needles. Diseased trees are unsalable as Christmas trees.

Control:

Brown spot needle blight can be controlled in Christmas tree plantations or in nurseries. Apply chlorothalonil (Bravo 6F) at 3 qt/100 gal. water or Bordeaux mixture (8-8-100) with a high pressure sprayer until run-off. These fungicides should be applied when the pine needles are one-half developed in the spring. In severely infected plantations or during an unusually wet year, a second spray should be applied 3-4 weeks later. To be effective, fungicides should be allowed to dry on the needles; therefore, they should not be applied during a rain.

Cultural control measures are as follows: 1) plant only healthy nursery stock; 2) plant resistance varieties; 3) cut, remove, and burn small pockets of brown spot infected trees that are considered to be non-salable; 4) do not shear infected plantations during wet weather and 5) reduce grasses and other vegetation within the plantation to a minimum in order to reduce relative humidity in the vicinity of the susceptible needles and to facilitate drying of foliage following periods of rainfall.

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 residue.
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.

SEE YOUR DOCTOR IF SYMPTOMS OF ILLNESS OCCUR DURING OR AFTER USE OF PESTICIDES.