53. Brown Spot Needle Blight of Pines

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Brown spot needle blight has long been a problem in the South. Within the last 20 years it has become a problem in the North, particularly in Christmas tree plantings.

Figure 53–1. Symptoms on Scots pine needles.

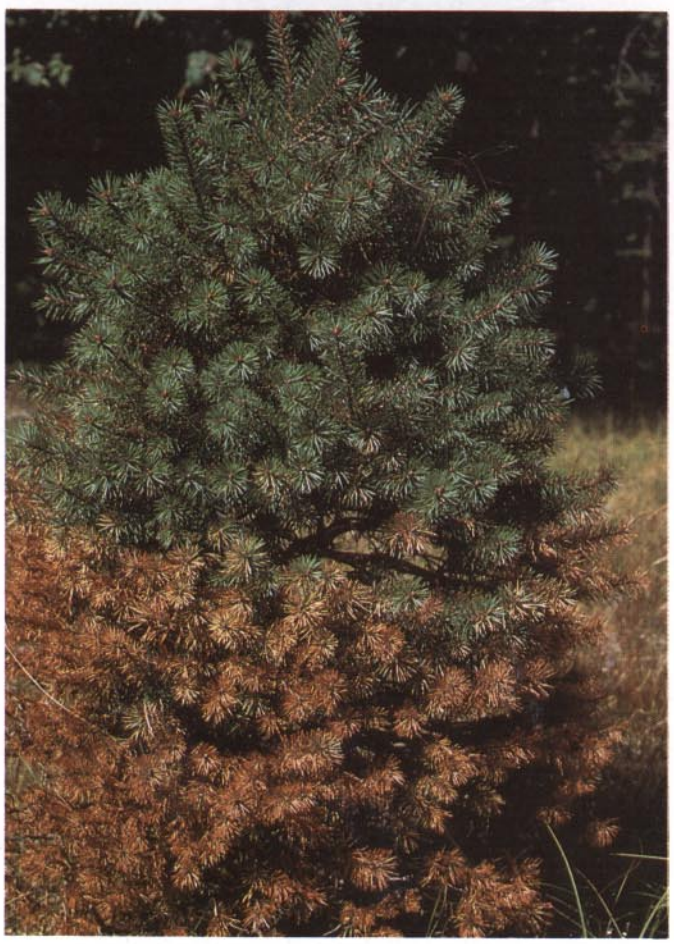

Figure 53–2. Brown spot on Scots pine tree.

Hosts and Distribution

The brown spot fungus, *Scirrhia acicola*, attacks 32 species of pine in 25 States from coast-to-coast. It is most common in the South, where it primarily attacks longleaf pine and, secondarily, other southern pine species. In the North it attacks most pines, particularly Scots pine in the mid- and north central States. Short-needled Scots pine varieties (Spanish and French green) are more susceptible than long-needled varieties (Austrian hills and German).

Symptoms and Signs

Initial symptoms appear on pine in eastern Nebraska during July. Yellow spots develop on needles and often become resin-soaked. These develop into brownish spots and conspicuous bands on Scots and ponderosa pine needles (fig. 53–1). Infected needles of all ages then start dying from the tips backward until the entire needle turns brown, and drops during the fall. The majority of infected Scots pine needles are found on lower branches on the north side of the tree (fig. 53–2). Although this pattern can result in bare branches, buds can usually produce new foliage the following spring. In severe cases, however, branches are killed.

Although the fungus has two types of spores in the South (conidia and ascospores), only the conidial spore stage (asexual) occurs in the Great Plains. Positive identification requires laboratory examination of conidia found in the fruiting bodies (acervuli). These are cylindrical, curved, 1–4 septate, 19–35 by 3.5–4.0 μm, and olive-green to brown (fig. 53–3). The fungus grows slowly on malt agar, forming conidia in an olive-green to black gelatinous matrix (fig. 53–4).

Disease Cycle

Sticky conidia oozing from fruiting bodies are responsible for disease build-up on trees and for tree-to-tree spread (fig. 53–5). These conidia are spread by rain splash, animals, and man, particularly when shearing wet foliage in Christmas tree plantations.

Conidia germinate and enter needles via stomata. The major infection period for pines in the Great Plains is June-July, although some infection can occur through September. New fruiting bodies with mature conidia are found on needles in late August, where they overwinter. With moisture present, the conidia germinate to infect developing, susceptible needles as they emerge in early summer (fig. 53–6). Mature needles are less susceptible to infection.

Damage

Brown spot has been reported to reduce total annual growth of southern pines by more than 16 million cubic feet. It is most severe on longleaf pine, inhibiting growth and causing mortality. Stem growth of heavily infected seedlings may be delayed 10 or more years.

In the North, the disease is a severe problem on certain varieties of Scots pine and other pine species used in Christmas tree plantations. Thousands of dollars have been lost annually in Christmas tree sales because excessive needle drop made trees unmerchantable. In the Great Plains, brown spot is a problem on ponderosa pine and on some varieties of Scots pine in landscape, windbreak, and Christmas tree plantings.

Control

Cultural practices, fungicidal sprays, and use of less-susceptible varieties are means for effective control of brown spot in the Great Plains. Cultural practices are: (1) use healthy nursery stock, (2) eliminate small pockets of infected trees, (3) do not plant seedlings next to older pine windbreaks, and (4) do not shear infected trees or plantations during wet weather. Fungicidal sprays of chlorothalonil (Bravo) or Bordeaux mixture, both registered by the EPA, provide excellent disease control. A first spray should be applied when new needles are nearly half grown. During wet years, or in severely infected plantations, a second spray should be applied 3–4 weeks later. Growers should use the long-needled varieties of Scots pine (Austrian hills and German) in Christmas tree plantations. Finally, to prevent catastrophic losses, tree growers should not plant all of their land to one species or variety of pine.

Selected References

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Figure 53-3. Conidia of *Scirrhia acicola* (left).

Figure 53-4. *S. acicola* growing on malt agar (right).

Figure 53-5. Fruiting bodies on needles (below).

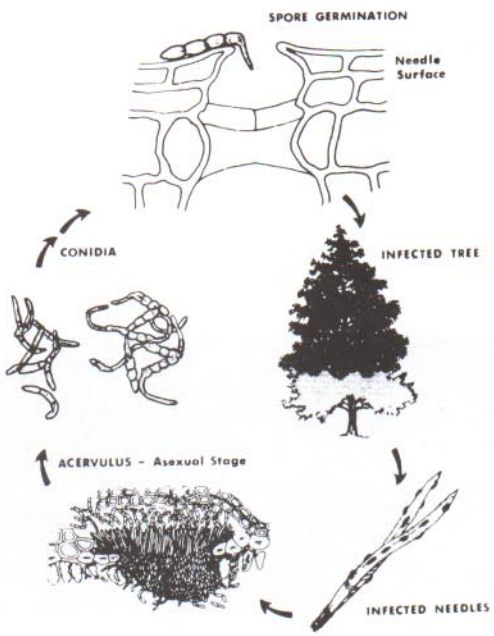

Figure 53-6. Disease cycle on Scots pine.