

16. Scleroderris Canker

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Hosts

Scleroderris canker, caused by the fungus *Gremmeniella abietina* (anamorph *Brunchorstia pinea*) consisting of several races and ecotypes, affects many conifer species. Two races of the fungus are known in North America. The North American race primarily affects jack and red pine in the Eastern United States and Canada and lodgepole pine in Western Canada. Austrian and eastern white pine are less commonly affected in the eastern region. The European race infects all pine species, but is primarily found on red and Scots pine and occasionally on Austrian and eastern white pine. The European race of the fungus is more aggressive than the North American race on these common hosts.

Distribution

The European race has been found in New York, Vermont, New Hampshire, Maine, southern Ontario, Quebec, New Brunswick, and Newfoundland. The North American race has been found in the Lake States, New York, and New England. In Canada, the North American race is widely distributed in Ontario, Quebec, Nova Scotia, and New Brunswick, and has occasionally been found in British Columbia and Alberta on lodgepole pine.

Damage

The disease can cause significant mortality to susceptible hosts in the nursery. The risk of spreading the fungus through nursery stock shipments is high because symptoms are frequently not visible until the spring after lifting and shipping even though infection occurred during the previous season. Infected seedlings die

after outplanting, but also serve as foci for further spread of the fungus. Outplanting of pine seedlings infected with either race may result in large losses in the field. Detection of diseased seedlings within the nursery may result in curtailment of seedling shipments and potential destruction of all similar nursery stock in the same field.

Diagnosis

Both races of the fungus cause similar symptoms on infected seedlings and the races cannot be distinguished by the morphological spore characteristics. Look for an orange-brown discoloration at the infected needle base (fig. 16.1). Infected needles later turn brown. Often infected needles are loose and drop during late spring and summer leaving only the bare stem. Infected buds die and, therefore, do not expand in the spring. Resinous lesions and a yellow-green discoloration under the bark are sometimes observed in recently killed tissue. Small, black fruiting structures called pycnidia (1 mm

wide) are commonly produced at the base of dead needles on dead stems (fig. 16.2). The spores (conidia) produced in pycnidia have 4 to 5 cells, pointed ends and are 30 by 3 microns in size. Microconidia (5.0 by 1.5 microns) are occasionally produced in some pycnidia.

Biology

The fungus is spread by airborne or rain-splashed spores. The North American race produces both asexual (conidia) and sexual spores (ascospores), while ascospores of the European race are rare. Ascospores are produced by dark brown apothecia; 1 mm wide, cup-like structures that form on dead infected twigs. Ascospores can initiate the disease in the nursery, but the asexual stage of the pathogen causes the greatest spread and damage.

Infection can take place throughout the growing season, but the primary infection period is from May to July. The fungus can grow at low temperatures in



Figure 16.1—Orange discoloration at base of needles infected by *Gremmeniella abietina*. Photo from USDA Forest Service Archive.



Figure 16.2—*Pycnidia* of *Gremmeniella abietina* at bases of infected needles on killed stems. Photo from USDA Forest Service Archive.

the winter down to -6 °C (21.2 °F) and becomes especially damaging under heavy snow when it can extensively colonize seedlings.

Control

Scleroderris canker is easily controlled in the nursery with regular fungicide applications. Begin treatment as

soon as new growth appears in the spring. Sprays should be repeated at 2-week intervals until the first of July, then at 4-week intervals until September. One or two extra sprays may be needed if rainfall is unusually heavy during early summer. The European strain may require spraying every 2 weeks until late October because of a longer spore dispersal period.

Selected References

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