MORTALITY OF BAREROOT COLORADO BLUE SPRUCE SEEDLINGS CLIFTY VIEW NURSERY, BONNERS FERRY, IDAHO

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Cause of mortality of 2-0 bareroot Colorado blue spruce (Picea pungens Engelm.) seedlings was investigated during a recent visit to the Clifty View Nursery, Bonners Ferry, Idaho. Affected seedlings were grouped in the most dense portions of seedbeds (figure 1). Foliar necrosis often started from the base of seedlings and progressed upward. Seedlings with advanced foliar necrosis had several prominent cambial lesions on their stems. On many seedlings with foliar symptoms and several asymptomatic seedlings, epiphytic growth of the ectomycorrhizal fungus Thelephora terrestris Ehr. was evident on the stem near the groundline (figure 2). Most of the tissues underneath this epiphytic growth during a recent visit to the Clifty View Nursery, Bonners Ferry, Idaho, appeared healthy.

Isolations were made from necrotic stem and needle tissue on 2 percent water agar, and several symptomatic seedlings were placed into moist chambers to induce sporulation of associated fungi. The most common organism found on diseased tissues was Sirococcus strobilinus Pruess, common cause of blight of Engelmann spruce (Picea engelmanni Parry)(James 1985) and ponderosa pine (Pinus ponderosa Laws.)(Schwandt 1981) seedlings at the Clifty View Nursery. Other associated organisms included Phoma, Trichoderma, and Botrytis cinerea Pers. ex Fr.

It appeared that S. strobilinus was the major cause of seedling mortality and that damage was most severe in dense portions of beds where foliage had difficulty drying out. Botrytis also probably contributed to the problem by colonizing necrotic tissues and hastening seedling death. This pathogen was found causing disease on grand fir (Abies grandis (Doug.) Lindl.) and blue spruce seedlings in other parts of the nursery during 1986 (James 1986). Occurrence of T. terrestris at the base of many seedlings indicates that beds were probably too dense. This fungus is usually a desirable ectomycorrhizal symbiont, but can "smother" seedlings if wet conditions prevail (Weir 1921).

Future losses can be controlled by reducing seedbed density and using fungicides as necessary. Chlorothalonil (Bravo®) is commonly used to control Sirococcus tip blight at the Nursery. Other effective fungicides include tridimefon (Bayleton®), ectaconazole (Vangard®), captafol (Difolatan®), and Dithane® (Kliejunas, Allison and McCain 1983; Smith 1972). However, fungicides should only be used to supplement cultural practices such as controlling the extent of irrigation and seedbed density.

Figure 1.--Bareroot blue spruce seedling mortality at the Clifty View Nursery. Mortality occurred in the most dense portions of seedbeds.

Figure 2.--Bareroot blue spruce seedling with epiphytic growth of Thelephora terrestris at its base (arrow). Botrytis cinerea also colonized necrotic tissues at the base of seedlings; however, tissues above the base were killed by Sirococcus strobilinus.

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