

ISOLATIONS FROM BAREROOT DOUGLAS-FIR  
SEEDLINGS--PRIEST RIVER EXPERIMENTAL FOREST

R. L. James, Plant Pathologist

Cooperative Forestry and Pest Management  
USDA Forest Service  
Northern Region  
Missoula, Montana

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Affected Douglas-fir seedlings had distinctive swellings at the groundline, often with necrotic cankers below the swelling. Necrosis often extended throughout the root systems. Tissues above the swelling were generally healthy.

Isolations were made from tissues on the edge of necrotic cankers. Tissues were surface sterilized in 10% sodium hypochlorite and incubated on water agar for 5-7 days at 20-22 C. Emerging fungi were transferred to potato dextrose agar slants for identification.

Isolation results are summarized in table 1. The most commonly isolated fungus was Alternaria alternata (Fr.) Keissler. This fungus was isolated from all sampled seedlings and 64 percent of all tissues from which isolations were made. Several species of Penicillium, one species of Ulocladium (probably U. atrum Preuss), and several unidentified bacteria were also frequently isolated from canker tissues.

Location of swellings and adjacent cankers and the general appearance of affected seedlings indicated that some abiotic factor, such as sunburn caused by intensive heat at the groundline, may have been the major cause of the problem. Similar damage to young seedlings has previously been ascribed to this or other abiotic causes.

The frequent occurrence of A. alternata on necrotic tissues does not necessarily mean that the fungus caused the disease. This fungus is a common soil inhabitant and is often isolated from necrotic plant tissues. Although it has been implicated in several plant diseases, particularly leaf spots, blights, and decays, its role as a pathogen of conifer seedlings is not well established. The fungus produces several metabolites including toxins that may be important in pathogenesis. Pathogenicity tests are required to elucidate the importance of A. alternata in causing cankering of Douglas-fir seedlings. The other organisms isolated were probably soil-borne saprophytes which colonized necrotic tissues.

Protecting susceptible seedlings with shade in the form of a lath covering is recommended. Further elucidation of the role of A. alternata in the etiology of the disorder would also be useful.

Table 1. Results of isolations from cankered Douglas-fir seedlings from the Priest River Experimental Forest.

No. of Seedlings Sampled: 6  
Percent with Alternaria alternata: 100  
Percent with Penicillium: 67  
Percent with Ulocladium: 33  
Percent with bacteria (unidentified): 50

No. of Isolations Made: 25  
Percent with Alternaria alternata: 64  
Percent with Penicillium: 32  
Percent with Ulocladium: 12  
Percent with bacteria (unidentified): 20  
Percent with none: 4

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