

MORTALITY OF BAREROOT WESTERN LARCH SEEDLINGS-  
J. H. STONE NURSERY, MEDFORD, OREGON

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Western larch (*Larix occidentalis* Nutt.) is one of the most important reforestation species of the Northern Region. Both containerized and bareroot stock are produced at the USDA Forest Service Nursery in Coeur d'Alene, Idaho. Bareroot stock produced at that nursery usually requires two growing seasons before seedlings can meet outplanting specifications. Growing 1-0 bareroot stock has generally been unsuccessful at Coeur d'Alene (resulting in seedlings which do not meet specifications). Production of 1-0 bareroot stock was attempted at a nursery that had a longer growing season. The nursery chosen for the trial was the J. H. Stone Nursery in Medford, Oregon. Seed were sown in the spring of 1987 with the hope of obtaining satisfactory seedlings after one growing season.

Seedbeds visited a couple of months after sowing had several seedlings with typical post-emergence damping-off and root disease symptoms. Soil where the seedlings were being grown had been fumigated with methyl bromide/chloropicrin in the late summer prior to sowing.

Several seedlings were collected and taken to the laboratory for analysis. Roots of affected seedlings were washed thoroughly under tap water to remove soil particles. Seven to 16 pieces (each 1-2cm in length of root) were aseptically placed on a selective medium for *Fusarium* spp. (Komada 1975). Roots were incubated for 7 days at about 22 degrees C under a regime of diurnal fluorescent light. Emerging fungi were identified.

*Fusarium oxysporum* Schlecht. was the only *Fusarium* species isolated from diseased larch seedlings. This organism was isolated from the roots of six of the eight (75 percent) seedlings. Approximate colonization rate of infected seedlings (estimate of the percentage of the root system colonized) was 71 percent.

The consistent association of *F. oxysporum* with disease symptoms implicates this organism as the principal cause of seedling mortality. The most likely source of inoculum was infested seed. Previous investigations (James 1986a; James 1987) have indicated that *Fusarium* spp. may commonly contaminate western larch seed. It is important that seedlots with potential disease

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problems (poor germination and lower than expected seedling establishment) be screened for presence of pathogens prior to sowing. This is especially true if seed is to be sown in fumigated soil or in container soil mixes which may lack normal competitors. In the absence of competitors, pathogens from seed may proliferate and cause extensive disease.

Although levels of disease at the J. H. Stone Nursery were not epidemic, they were high enough for growers to be concerned. Treatment of affected seedbeds with fungicides, such as benomyl, may help reduce further disease spread. However, the best method of control is prevention by reducing amounts of *Fusarium* inoculum on seed. Running water rinses commonly employed at the Coeur d'Alene Nursery (James 1984; James 1986b) reduce but do not eliminate *Fusarium* on seed. It is therefore recommended that seedlots suspected of containing high levels of *Fusarium* be screened prior to sowing; if they have high pathogen levels, appropriate treatments with surface sterilants may be necessary.

#### LITERATURE CITED

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