

WESTERN LARCH SEEDLING NEEDLE NECROSIS-
RAINTREE NURSERY, LIBBY, MONTANA

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Western larch (*Larix occidentalis* Nutt.) is an abundant reforestation species in the Northern Rocky Mountains. It is one of the most important species produced in nurseries in the area. However, growers sometimes experience problems growing larch seedlings. The most common problems include Botrytis blight (James 1984a), root diseases (James 1986c; James 1987), and abiotic damages such as heat and pesticide injury (James 1986a; James 1986b). Larch seedlings are fast growing and their foliage is often very sensitive to changes in ambient air temperatures, especially during certain portions of their growth cycle.

Several containerized western larch seedlings grown at the Raintree Nursery in Libby, Montana displayed needle chlorosis and necrosis (fig. 1). Affected foliage was concentrated near the tip of seedlings; necrotic needles were often twisted, indicative of wilting.

Six seedlings with various levels of needle discoloration were selected for laboratory analysis. Roots of all six seedlings appeared healthy for the most part, although a few necrotic root tips were found. Microscopic examination of necrotic needles indicated some superficial mycelial growth of an unknown fungus. However, there was no evidence of infection by common larch needle pathogens such as *Meria laricis* Vuill. and *Hypodermella laricis* Tub. Because patterns of needle discoloration were similar to those found on Douglas-fir seedlings with Fusarium root disease (James 1984b; James 1984c), isolations were made from the roots of the six larch seedlings. Twenty-five pieces of root, each about 1-2 cm in length, were randomly selected from each root system and aseptically placed on a selective medium for *Fusarium* spp. (Komada 1975). Root pieces were incubated for 7 days at about 22 degrees C under a regime of diurnal fluorescent light.



Figure 1.--Containerized western larch seedling with chlorotic/necrotic foliage from the Raintree Nursery, Libby, MT.

Fusarium was found on roots from three of the six seedlings sampled. However, number of root pieces colonized was very low (usually less than 10 percent for each infected seedling). *Fusarium nivale* (Fr.) Ces. was the only species isolated. An unidentified species of *Phoma* (similar to *P. herbarum* (Westend.) or *P. glomerata* (Cda.) Wollen. & Hochapf.) was also isolated. However, neither of these organisms was isolated with enough consistency to likely be responsible for the needle discoloration. Occurrence of *Fusarium* spp. on nondiseased conifer seedlings is not uncommon (James et al. 1987). Also, previously *F. nivale* has not been isolated frequently from conifer seedlings, and its role as a pathogen is unknown.

Growers indicated that discolored needles were concentrated in one greenhouse and affected seedlings occurred randomly rather than concentrated in certain areas. Also, they indicated that the number of affected seedlings had not increased much since the problem was first discovered. This information, coupled with isolation results discussed above, would indicate that the major cause of the disorder was probably not pathogenic organisms, but rather some abiotic factor such as sudden changes in temperatures or adverse reactions to chemical applications. Close monitoring of greenhouse temperatures and insuring adequate cooling should help alleviate future problems.

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