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NECROTIC BANDING OF PINE SEEDINGS PLUM CREEK NURSERY, PABLO, MONTANA

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During mid June, 1990, several widely scattered lodgepole (***Pinus contorta*** Dougl.) and ponderosa (***Pinus ponderosa*** Laws.) pine seedlings at the Plum Creek Nursery (Pablo, Montana) had symptoms of necrotic needle banding. Affected needles had chorotic bands that were brown to light red in color (Figure 1). Necrotic bands usually remained distinct and separated by normal green tissues; bands did not often coalesce to form necrosis of entire needles. Symptomatic seedlings were scattered throughout affected seedlots rather than being concentrated in certain portions of greenhouses.

Growers felt that the cause of these symptoms might be ***Dothistroma pini*** Hulb., cause of "red band needle blight" (Peterson 1982). However, examination of necrotic needles under the microscope failed to reveal presence of fungal fruiting structures of ***Dothistroma*** or other common needle cast fungi of pine (Darker 1932).

Several needles with banding symptoms were washed thoroughly under running tap water for several minutes and either placed in petri dish moist chambers containing filter paper moistened with sterile, distilled water or aseptically placed on 2% water agar. Moist chambers and agar dishes were incubated under diurnal cycles of cool, fluorescent light for 5-7 days at about 24°C and then examined for occurrence of fungi.

Most necrotic needle zones were thoroughly colonized with ***Botrytis cinerea*** Pers. ex Fr. This fungus sporulated readily on tissues incubated both within moist chambers and on water agar. Other fungi occurring less frequently included ***Alternaria***, ***Penicillium***, and ***Phoma***. Potential needle cast pathogens of pine seedlings, such as ***Lophodermella*** and ***Lophodermium*** spp. (Darker 1932), were not present.

It is likely that ***B. cinerea*** was either responsible for the needle banding or colonized tissues killed by something else. ***Botrytis*** usually colonizes senescent needles near the bottom of conifer seedling crowns where conditions for fungal development are most conducive (James 1984). Under the right environmental conditions, these fungi may spread to healthy needles within the seedling canopy. ***Botrytis*** rarely colonizes the upper needles of seedling crowns unless these needles have been damaged (Sutherland and others 1989). Therefore, it is likely that the fungus colonized pine needle tissues which had become injured. Possible factors that might have contributed to needle injury include fertilizer toxicity or phytotoxic responses to fungicides (Landis and others 1990). Chemical

toxicity, particularly associated with variable soil moisture, might have been responsible for the type of banding found on the pine seedlings (Landis and others 1990).

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Figure 1. Necrotic needle banding of container-grown lodgepole pine seedling - Plum Creek Nursery, Pablo, Montana.