LODGEPOLE PINE SEEDLING NEEDLE NECROSIS - WESTERN FOREST SYSTEMS NURSERY, LEWISTON, IDAHO

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At the end of September 1987, containerized lodgepole pine (*Pinus contorta* Dougl.) seedlings at the Western Forest Systems Nursery, Lewiston, Idaho, were extracted from their containers and shipped to western Montana for fall outplanting. Because of unusually dry summer and fall weather, conditions were not conducive for outplanting. Therefore, the stock was returned to the nursery at the end of October for storage within the greenhouses until the following spring. The seedlings had been transported in refrigerated trucks and stored under refrigeration. However, they were subjected to above-freezing temperatures during a portion of their storage time.

Shortly after the seedlings were returned to the nursery, needletip necrosis began to appear on several of the seedlings. Affected seedlings were randomly located throughout affected seedlots. Necrotic needletips appeared greyish and watersoaked (figure 1). In some cases, black structures appeared on affected needletips. A few of the affected seedlings had accumulations of soil mix (peat and vermiculite) on the needles. In a very few cases, necrosis had extended from the needles into the stem and definitive lesions were present.

Roots of affected seedlings were examined under the microscope (10-50X) and appeared healthy with little or no indication of necrotic lesions that might indicate root disease (Bloomberg 1971). Affected needles were washed thoroughly under tap water and placed in moist chambers which were incubated at about 22 degrees C for 5 days.

Necrotic needles were commonly colonized with *Botrytis cinerea* Pers. ex Fr. (figure 2), a common pathogen of containerized conifer seedlings (James 1984). Stem lesions were also colonized by this fungus, and the black structures on necrotic needle tissues were most likely sclerotia of *Botrytis*. No other potentially pathogenic fungus was found on necrotic tissues.

Figure 1.--Needletip necrosis of recently stored containerized lodgepole pine seedlings. Affected needletips appeared greyish and watersoaked.

Figure 2.--Sporulation of *Botrytis cinerea* on necrotic needletip of containerized lodgepole pine seedling

Apparently, *Botrytis* was present on some of the stock packed for shipment and infection expanded during periods of transit or storage. The best way to reduce spread of *Botrytis* during storage is by keeping box temperatures below freezing. If temperatures are above 0 degrees C, the fungus can grow vegetatively and spread throughout boxes. Some inoculum may have come from the soil mixes as there were indications that these mixes were on the foliage of several diseased seedlings.

Affected seedlings can be treated with fungicides to help reduce spread and further losses. Chlorothalonil and dicloran are two commonly used fungicides to control *Botrytis* (James 1984). Alternating fungicides should help reduce the possiblilities of the fungus acquiring tolerance to any one chemical (James and Woo 1984; James and Gilligan 1985).

LITERATURE CITED

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