FUSARIUM ASSOCIATED WITH CONTAINERIZED CONIFER SEEDLING DISEASES AT THE POTLATCH AND WESTERN FOREST SYSTEMS NURSERIES, LEWISTON, IDAHO AND UNIVERSITY OF IDAHO NURSERY, MOSCOW

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During recent visits to three north central Idaho nurseries (University of Idaho Nursery, Moscow; Potlatch Nursery, Lewiston; Western Forest Systems Nursery, Lewiston), several scattered containerized seedlings with apparent disease symptoms were found. Symptoms appeared similar to those of root disease caused by *Fusarium*; i.e., needle tip dieback and chlorotic or necrotic foliage (James 1984a; James 1984b). In order to assess importance of *Fusarium* at these nurseries, several sympotmatic seedlings were collected and taken to the laboratory for analysis.

Seedling roots were washed thoroughly under tap water to remove soil particles; tips of eight to 16 randomly selected roots were surface sterilized in 10 percent aqueous sodium hypochlorite and placed on a selective medium for isolation of *Fusarium* (Komada 1975). Isolated fusaria were identified using standard taxonomic guides (Booth 1971; Gerlach and Nirenberg 1982). A total of 400 root tips from 27 seedlings were sampled (table 1).

Species of *Fusarium* were isolated from all seedlings and from about two thirds of the root tips sampled (table 1). Several seedlings had most or all of their root tips colonized by *Fusarium*. The major species isolated was *F. oxysporum* Schlect., a common associate of containerized conifer seedling diseases (James 1985a). *Fusarium avenaceum* (Cda. ex Fr.)Sacc. was isolated from two diseased ponderosa pine seedlings. This species has been previously reported on bareroot (Crandall 1938; Crandall et al. 1945) and containerized (James 1985b; James and Gilligan 1985) stock, although it is not encountered as often as *F. oxysporum*.

Occurrence of *Fusarium*-associated diseases at these three Idaho nurseries was not extensive. Disease incidence probably varied among seedlots, indicating that initial inoculum was seedborne (James 1985a). If necessary, losses can be reduced by seed treatments or fungicide drenches shortly after sowing. Early damping-off losses are usually limited by such treatments. However, effectiveness of fungicides in controlling root diseases when seedlings are older is much less because pathogenic fungi are often concentrated near the base of container plugs (James 1984b). There is an important need to develop alternative control approaches since problems of *Fusarium*-associated diseases of containerized seedlings are widespread in northern Rocky Mountain nurseries.

Table 1.--Occurrence of *Fusarium* on roots of diseased containerized conifer seedlings.

Nursery[1]	Conifer species[2]	No. seedlings sampled	No. roots sampled	Percent root infection with *Fusarium*	*Fusarium* species[3]
UI	DF	2	30	63.3	FOXY
PN	DF	10	150	76.0	FOXY
PN	PP	2	30	53.3	FAVE
PN	ES	4	61	85.3	FOXY
WFS	WL	9	129	58.8	FOXY
Totals	-	27	400	66.0	-

[1]UI = University of Idaho Nursery, Moscow
PN = Potlatch Nursery, Lewiston
WFS = Western Forest Systems Nursery, Lewiston

[2]DF = Douglas-fir
PP = Ponderosa pine
ES = Engelmann spruce
WL = Western larch

[3]FOXY = *Fusarium oxysporum*
FAVE = *Fusarium avenaceum*

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