OCCURRENCE OF *FUSARIUM* ON WESTERN LARCH SEED FROM THE NISHEK NURSERY, BONNERS FERRY, IDAHO

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Western larch (*Larix occidentalis* Nutt.) seed sown for bareroot stock production during early June 1985 at the Nishek Nursery, Bonners Ferry, Idaho, resulted in very poor germination and germling emergence. Two lots, one from Champion Timberlands and the other from the Idaho Department of Lands (IDL), yielded especially poor stands of germlings. Growers were concerned that pathogens may be involved in the poor seed performance and wanted to find out why poor germination and germling emergence were occurring. Since western larch seed is highly valuable and often scarce, it was necessary to investigate the problem to determine causes and to formulate procedures for reducing future losses.

John Schwandt, pathologist for the IDL, visited the Nursery and collected seeds which had not germinated. Seeds were collected directly from seedbeds. Samples were sent to the Cooperative Forestry and Pest Management laboratory for analysis.

Forty-one seeds from the Champion lot and 37 from the IDL lot were aseptically dissected to evaluate occurrence of decayed or healthy-appearing endosperms (table 1). Endosperms and seedcoats of each dissected seed were placed on a selective medium for *Fusarium* (Komada 1975), common seed-borne pathogens that affect germination and establishment (James 1985a). Plates were incubated at about 22°C for 7 days under a 12-hour light-darkness regime and examined for presence of *Fusarium*. Suspected *Fusarium* isolates were transferred to carnation leaf agar to facilitate identification (Fisher et al. 1982); standard taxonomic guides were used for isolate identification (Booth 1971; Gerlach and Nirenberg 1982).

Only about 2 percent of the seed examined had healthy-appearing endosperms that were possibly capable of germinating (table 1). The remainder were either without endosperms or their endosperms were extensively decayed and colonized with fungi. *Fusarium* spp. were isolated from almost 90 percent of the seed from the Champion seedlot and 65 percent of the seed from the IDL lot. Fusaria were located on the outer and inner portions of seedcoats and within decayed endosperms.

Fusarium oxysporum Schlect. was frequently isolated from both sampled seedlots. The other species isolated from the Champion seedlot was *F. sambucinum* Fuckel.

Table 1.--Occurrence of *Fusarium* on western larch seedlots from the Nishek Nursery, Bonners Ferry, Idaho.

Seedlot	No. seed sampled	Percent healthy endosperms[1]	Percent with *Fusarium*	*Fusarium*[2] species
Champion	41	2.4	87.8	FOXY, FSAM
Idaho Dept. of Lands	37	2.7	64.9	FOXY

[1]Healthy endosperms without decay and probably capable of germinating.

[2]FOXY = *Fusarium oxysporum*
FSAM = *Fusarium sambucinum*

The levels of *Fusarium* encountered on these larch seedlots were much higher than those previously reported on other conifer species, such as Douglas-fir (James 1983; James 1984a; James 1984b; James 1986) and ponderosa pine (James and Genz 1981; James and Genz 1982). However, these high levels were comparable to those from several spruce seedlots which also had poor germination (James 1985b). Such high levels of *Fusarium* on seed will lead to poor germination and very high damping-off losses, as occurred at the Nishek Nursery. Screening suspected diseased lots for levels of contamination is a valuable tool for predicting expected losses. If *Fusarium* levels are high, seed treatments using chemical sterilants may be warranted. Effects of such treatments on western larch seed viability and seedling establishment need to be elucidated. The importance of sowing viable, pathogen-free seed cannot be overemphasized if a good stand of seedlings is to be obtained.

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