

OCCURRENCE OF FUSARIUM OXYSPORUM ON PONDEROSA PINE SEED
FROM THE USDA FOREST SERVICE NURSERY, COEUR D'ALENE, IDAHO

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Two ponderosa pine (Pinus ponderosa Laws.) seedlots from the Slate Creek Ranger District, Nezperce National Forest, were tested for occurrence of Fusarium which might have been involved in the poor germinative performance of the lots. Presowing germination tests of both lots yielded less than desirable results (table 1). Seedlot 6466 was collected from the Milner Seed Production area by climbing selected trees and obtaining mature cones. However, lot 6509 was obtained from squirrel cache cones.

Table 1.--Percentage germination of selected ponderosa pine seedlots from the Slate Creek Ranger District, Nezperce National Forest.

Days	Seedlot	
	6544	6509
<u>Stratified</u> ¹		
7	59.5	79.0
14	62.0	81.0
21	62.0	81.0
<u>Unstratified</u>		
7	52.0	70.0
14	60.5	79.5
21	61.5	80.0

¹ Stratified for 28 days.

Sample seed from each seedlot was divided into two groups; one was soaked in standing tap water for 24 hours before being assayed for presence of Fusarium. The other group was assayed directly without pretreatment. Twenty-five seeds per seedlot from each group were aseptically dissected to expose their endosperm and then were placed on a selective medium for Fusarium (Komada 1975). Seeds not dissected were placed directly on the selective medium. A total of 150 seeds were sampled per seedlot. Plates were incubated for 7 days at about 22°C under a 12-hour diurnal cycle of cool fluorescent light. Emerging fungi thought to be Fusarium were transferred to potato dextrose agar and carnation leaf agar for identification (Nelson et al. 1983).

Results of the assay are summarized in table 2. The only Fusarium species isolated was F. oxysporum Schlecht. This organism was found on 8.6 percent of the seeds sampled in lot 6509, but was not found on any seed in lot 6466. A greater amount of F. oxysporum was detected within the endosperm than on the seedcoat. Soaked seeds also yielded more Fusarium indicating possible spread of inoculum during soaking.

Table 2.--Occurrence of Fusarium oxysporum on ponderosa pine seedlots from the USDA Forest Service Nursery, Coeur d'Alene, Idaho.¹

	Seedlot	
	6466	6509
Soaked	-	-
Seedcoat	0	12.0
Endosperm	0	20.0
Not soaked	-	-
Seedcoat	0	4.0
Endosperm	0	4.0
All seed	-	-
Seedcoat ²	0	6.0
Endosperm	0	12.0
<u>Total</u>	<u>0</u>	<u>8.6</u>

¹ Figures in table represent percent of sampled seeds colonized with Fusarium oxysporum. A total of 150 seeds were sampled per seedlot.

² Of the dissected seeds (50 total per seedlot), 16.0 percent were either empty or severely decayed in seedlot 6466 and 6 percent were empty in seedlot 6509.

Although Fusarium was not detected within seedlot 6466, this lot had a relatively high percentage of its seed (16 percent) that were either empty (without endosperms) or with extensively decayed endosperms. This may account for the poor germination experienced for this lot. Fungi isolated from seedcoats and endosperms of lot 6466 included common species of Penicillium and Trichoderma, usually not considered pathogens. Although causes of the empty or decayed endosperms of this lot are not known, common seed-colonizing fungi may have been involved.

This evaluation confirms previous work (James 1985) indicating that Fusarium is much more common on seedlots collected from squirrel cache cones. If possible, collection of cones from caches should be avoided because it is difficult to obtain clean seeds from such sources. The level of infection of seedlot 6509 was probably high enough to warrant concern on the part of growers. A high percentage of infected seeds may result in higher than usual damping-off or root disease losses. Since many of the seeds were infected within the endosperm, treatments designed to sterilize seedcoats would be of only limited value.

LITERATURE CITED

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