FUNGI ON BLEACH-TREATED WESTERN WHITE PINE SEED, RAINTREE NURSERY, LIBBY, MONTANA

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During the past year certain seedlots of western white pine (*Pinus monticola* Dougl.) from the Moscow Arboretum have had problems with extensive fungal contamination that has resulted in very poor germination and low seedling production. For example, one seedlot tested from the Plum Creek Nursery in Pablo, Montana, had more than 50 percent of the assayed seed infected with *Pythium* spp. (James 1987). These fungi were usually located within the endosperm. Seed from the Plum Creek Nursery were also infected with *Fusarium* spp., although at much lower levels.

The Raintree Nursery in Libby, Montana planned to grow white pine seedlings during 1987 and decided to treat their seed with bleach (aqueous sodium hypochlorite solution) prior to sowing in the hope of reducing fungal contamination and improving seed germination and seedling establishment. Samples of treated seed were assayed for presence of potentially pathogenic fungi using a selective medium for *Fusarium* spp. (Komada 1975) and one for *Pythium* spp. (composed of V-8 juice agar amended with pimaricin, rifamycin, ampicillin, and PCNB). Eighteen seed, which had been bleach treated, were assayed on the *Fusarium* medium and 13 on the *Pythium* agar. Each assayed seed was aseptically dissected in half with each piece placed directly on the agar surface. Those seed on the *Fusarium* media were incubated for 7 days at 22 degrees C under cool fluorescent light and those on the *Pythium* media were incubated in the dark for 5 days. Fungi emerging from the seed were identified and colonization percentages calculated.

Seed assayed on the *Fusarium* medium were infected with the following fungi: *Trichoderma* (30.5 percent), *Penicillium* (5.5 percent), unidentified bacteria (72.2 percent), and *Fusarium* (25.0 percent). All isolates of *Fusarium* were identified as *F. oxysporum* Schlect. *Pythium* spp. were isolated from 32.1 percent of the seed. These high levels of *Fusarium* and *Pythium* infection occurred despite treating seed with bleach. Apparently, much of the fungal contamination occurred within the endosperm, although this investigation did not determine differences between seedcoat and endosperm colonization.

Seedlots extensively colonized with either *Fusarium* or *Pythium* will probably have reduced germination and high levels of pre-emergence and post-emergence damping-off losses. Because of problems with fungal contamination of aboretum western white pine seed, it is recommended that future seedlots be assayed for presence of fungi prior to sowing to evaluate potential germination and disease problems.

LITERATURE CITED

James, R. L. 1987. Occurrence of fungi on western white pine seed, Plum Creek Nursery, Pablo, Montana. USDA Forest Service, Northern Region. 3p.

Komada, H. 1975. Development of a selective medium for quantitative isolation of *Fusarium oxysporum* from natural soil. Rev. Plant Protec. Res. 8:114-125.