CANADA

Timber Talks

Department of Fisheries and Forestry

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Protect Your Nursery Seedlings No. 70

Production of planting stock in forest nurseries is an integral part of forest management in British Columbia. Many problems occur within the nurseries that reduce the quantity and quality of the seedling. An important one is a pre-emergent damping-off disease caused by a fungus. Fail areas occur in infected seedbeds where ungerminated seed and pre-emergent seedlings have been killed. A fungicidal seed protectant, thiram, has been used to control the disease but inasmuch as some results from the treatment have been detrimental, its use was investigated.

The effect of thiram treatment on germination, germination speed, phytoprotection, phytotoxicity and growth was tested on two lots of Douglas-fir seed. One had low germinative capacity and about 40 per cent of the seed-coats cracked; the other had a high germination and 10 per cent cracked seed-coats. Germination tests were carried out under sterile conditions in the laboratory where seeds were incubated in darkness at 25°C. Diseased seeds were detected microscopically, viability of normal seeds determined by tetrazolium chloride and speed of germination calculated as number of days for 50 per cent of the filled seeds to germinate. In experimental nursery beds, seedlings that did not emerge were recovered from the soil and classed as pre-emergent damping-off or ungerminated, and speed of emergence calculated as number of days after sowing for 50 per cent of the germinated seeds to produce emerged seedlings. Disease isolations were performed on seeds and seedlings.

Uninjured and unstratified seed treated with thiram were normal but all others were usually diseased. Fungicidal treatment reduced the speed of germination especially if the seed-coat was injured, and if the seeds were unstratified there was a reduction in the number of germinants. Speed of germination and germination per cent of low germinability seed was reduced by about 50 per cent; germination per cent of high germinability seed was not affected but the speed of germination was reduced. High dosages of thiram and treatments before seed stratification reduced germination speed of seeds more than low dosages and applications after seed stratification. Tests in nursery beds gave results similar to the laboratory experiments. In addition, some seedling malformation was associated with thiram treatment. Dense sowing of thiram treated seeds generally reduced emergence.

There is a variation in the effectiveness of thiram as a seed protectant and its detrimental effects. Seed may be killed, its germination inhibited or be merely retarded. Seed-lots having a high percentage of severely injured seeds, unstratified seeds and densely sown seeds are most affected.

General recommendations for the use of thiram is that seeds that must be stratified should be treated with the fungicide before sowing. Treatment of seed not requiring stratification, as in fall sowing, would probably be more harmful than beneficial. Thiram application up to 25% with "Arasan 75" formulation would benefit vigorous seed-lots that are not adversely affected by stratification.

REPORT: Effect of Thiram Seed Treatment on Douglas fir Germination and Disease. W.J. Bloomberg and J. Trelawny. Forest Research Laboratory, Victoria, B.C.