

FRDA Research Memo

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Grey Mould Control by Seedling Canopy Humidity Reduction through Under-bench Ventilation and Styroblock Aeration

FRDA Report 077

In experiments conducted from June to December 1988 at a Saanichton nursery, Michael Peterson of AFS Applied Forest Science Ltd. was contracted to work with Jack Sutherland of Forestry Canada to test environmental methods for grey mould on nursery-grown seedlings.

The incidence of grey mould, caused by the fungus *Botrytis cinerea*, is a serious threat to container-grown conifer seedlings in British Columbia. Douglas-fir is a species that is particularly susceptible to mould attacks. Many seedlings, if not killed in the nursery, become sufficiently weakened by the disease so as to jeopardize their survival after outplanting. Current methods of mould control consist of use of fungicides. Peterson and Sutherland cite findings by Glover, 1985 which show that in spite of the spray programs, nurseries are experiencing increased yield loss and that the sprays themselves are causing the development of a strain of spray-tolerant mould.

The authors postulated that with a susceptible host such as Douglas-fir and the inevitable presence of grey mould spores, one possible way to control a potential epidemic would be to alter as much as possible, the environmental conditions that favor the proliferation of grey mould. Thus, they speculated that lowering seed canopy humidity and reducing the amount of time that the moisture remained on the needles after irrigation by overhead boom could result in effective grey mould control.

In the experiment, coastal Douglas-fir seedlings, grown at a density of 764 seedlings/m², were raised in modified styroblocs on benches 1 m above an asphalt floor. The seedlings were divided into four lots of 90 styroblocs each. Group 1 was the control group using standard configuration styroblocs. Groups 2, 3, and 4 used styroblocs modified by 135 6mm holes made through the depth of the block, promoting airflow from below up through the seedling canopy. These three groups were then subjected to varying venting conditions. Group 2 received heated, under-bench forced air, Group 3 received ambient under-bench forced air while Group 4 received no forced airflow.

Microclimatic variables such as air and soil temperature, relative humidity, and needle wetness were measured and recorded. Peterson and Sutherland also measured seedling height (from root collar to bud tip) and stem diameter (at root collar) to assess the morphological effects of the altered conditions. It was concluded that venting, short term temperature changes, and styroblock aeration caused no adverse effects on seedling growth.

The conclusions of the Saanichton experiment were based on the incidence of grey mould and the severity of the disease. The mean disease incidence for the control group indicated that 75 percent of the seedlings were affected by grey mould compared with 25 percent in the three vented groups. The mean severity rating of the diseased seedlings in Group 1 ranged between "light" and "light-moderate". In contrast, the affected seedlings in Groups 2-4 had a mean severity rating of "very light."

It was concluded that aeration of styroblocs and venting did reduce the severity and incidence of grey mould. Of the venting techniques, the most favorable for disease prevention was cool (ambient) airflow. The application of heated air was found to accelerate the evaporation of moisture on the needles but it also had negative effects on relative humidity and air temperature.

Copies of the 13-page report *Grey Mould Control by Seedling Canopy Humidity Reduction through Under-bench Ventilation and Styroblock Aeration* by Michael Peterson and Jack Sutherland are available while supplies last from:

Forestry Canada
Pacific Forestry Centre
506 West Burnside Road
Victoria, B.C. V8Z 5M1

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