CANADA

Timber Talks

Department of Fisheries and Forestry

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CONTROL NURSERY DISEASES No. 49

Nursery diseases have not been considered as being of major importance, but the spread of corky root disease in older nurseries and the common occurrence of root rot in new ones established on former farmland requires reappraisal of the problem. Soil fumigation has reduced disease and in some instances enhanced seedling growth, but information on the contribution of different microorganisms to various syndromes is inadequate. To obtain a better understanding of the subject a soil fumigation study was conducted, using a nematicide with weak fungicidal properties, a general biocide and a fungicidal seed dressing.

Plots, established in diseased areas in old and new nurseries, were ploughed and cultivated to a fine tilth prior to fumigation. In May 1966, the general biocide methyl bromide and the nematicidal fumigant "D-D" was applied to the soil at different rates and Douglas-fir seeds were treated with the fungicidal dressing thiram. At the termination of the soil ventilation period, treated seeds with a determined germination were broadcast sown on the plots. One and six months after germination, counts were made of living, diseased and dead seedlings. Diseases were classified as corky root, post-emergence damping-off and root rot. Fungi were isolated from seedling roots and shoots, and populations of fungi and nematodes in the soil were estimated.

Both fumigants improved seedling emergence, reduced root rot, eliminated corky root disease and reduced nematode populations. Application at half rate was virtually as effective as at full. Treatment of the seed reduced post-emergence damping-off but did not influence the number of emergents nor the prevalence of corky root disease or root rot. Root and shoot length and dry weight was improved by both the fumigant treatments, but not by coating the seed with fungicide dressing. Two weeks after fumigation the number of fungus colonies in the soil was less than before treatment, but the number increased during the following six months.

The effect of the fumigants and seed treatment suggest that either the organism responsible for post-emergence damping-off are seed-borne and those responsible for pre-emergence damping-off and root rot are soil-borne, or that seed treatment gave continued protection only to the seedlings that were vigorous and escaped pre-emergence damping-off. Although not confirmed, there are indications that interaction of nematodes and fungi are related to the incidence of corky root disease and root rot and that a symptomless infection of the roots by a fungus often proceeds root rot.

REPORT: Chemical control of root disease of Douglas-fir seedlings in relation to fungus and nematode populations. W. J. Bloomberg and W. R. Orchard, Forest Research Laboratory, Victoria, B.C.