FUNGACIDAL CONTROL OF RHIZOCTONIA DAMPING-OFF

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One approach to the control of damping-off diseases in forest tree nurseries is by the repeated application of fungicides to the seedbeds. This paper reports the effectiveness of two fungicides in the control of Rhizoctonia damping-off of tree seedlings. It tells of the 1954 results from one of three co-operative projects on damping-off diseases cared on at the Forest Nursery Station by the author and Dr. O. Vaartaja.[1]

Seed from two seed trees of Colorado spruce (Picea pungens Engelm.), Scotch pine (Pinus sylvestris L.) and Caragana (C. arborescens Lam.) was utilized. All seed was surface sterlized, stratified and then sown on September 28 in flats containing a 1:1 mixture of seedbed soil and sand. Inoculum of the Rhizoctonia culture, which proved (2) the most virulent damping-off isolate, was applied to the surface of the germination medium immediately following the sowing of the seed. Two fungicides, Captan and Tersan, which were previously found (1) to be non-toxic to tree seeds, were applied as water suspensions at five concentrations and at nine weekly intervals starting on October 1. Records for emergence, losses and stand were taken every second day from October 3 to December 10. Results for seedling stand of the three tree species 74 days after sowing of the seed, have been summarized in Table 1 at the end of this article.

Conclusions from this study were as follows:

1. Pre-emergent losses, emergence, post-emergent losses and final stand varied from tree to tree within species as well as between species.

2. The average pre-emergent losses for the three tree species under the check treatment was equivalent to 30% of the seed sown.

3. Emergence of tree seedlings was increased 11% on the average by application of, a 0. 1 grams per square foot suspension of either fungicide.

4. Post-emergent losses were reduced 35% by the application of the lowest concentration of either fungicide.

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5. Average stand of tree. seedlings was increased from 40% to 65%, and from 40% to 76%, respectively by light applications of Captan and Tersan.

6. Further study is required to determine concentrations and procedures to obtain complete stands in Rhizoctonia infected soil.

References

Table 1.--Stand of seedlings (%)[1/] for three tree species in Rhizoctonia inoculated seedbed soil under 5 concentrations of 2 fungicides.

(Means for 3 replications)

Fungicide & Concentration[2/]		Tree Species & Seedling Stand			Mean for conc.
		Picea pungens	Pinus sylvestris	Caragana arborescens	
Captan	check	21.4	27.3	67.3	38.7
	0.1	39.3	69.3*	86.7*	65.1*
	0.5	29.6	60.6	95.2*	61.8*
	2.5	18.5	53.3	79.1	50.3
	10.0	3.3	8.6	87.3	33.1
Tersan	check	21.3	33.4	67.7	40.8
	0.1	58.7*	75.3*	93.3*	75.8*
	0.5	46.6	73.3	96.0*	72.0*
	2.5	46.0	53.3	89.8	63.1*
	10.0	44.0	46.8	91.3	60.7*

1/ Seedling stand in 74 days as a percentage of the stratified seed sown
2/ Fungicide concentration in grams per sq. ft. applied at 9 weekly intervals
* Significantly greater than check

1. Cram, W. H. and 0. Vaartaja. Toxicity of eight pesticides to Spruce and Caragana Seed. Forestry Chronicle: 31:247-249. 1955.

2. Vaartaja 0. and W. H. Cram. Damping-off pathogens of conifers and Caragana. (In press for Phytopathology 1955).