CULTURAL TECHNIQUES[1/]

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(Panel Moderator)

FUNGICIDE PRACTICES AT ARKANSAS FOREST NURSERIES

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The treatment of fungus in the nursery is one of our most important problems. In maintaining a microclimate suitable for germination and growth of germinates, we are creating an ideal situation for fungus damage. Our main damages are pre- and post-emergence damping-off and root rot. (Too often pre-emergence damping-off is attributed to the quality of the seed). We try to control the environmental conditions of our nurseries by:

1. Using sawdust and fertilizer to keep the pH of our soil below 5.8, which we know is very high for pine trees.

2. Planting in early spring to avoid high temperatures (over 85°) during germination and until secondary needles are formed.

3. Keeping our nitrogen content low during this time. No legumes for soil building just prior to planting.

4. Keeping the beds as dry as we dare by irrigating early in the day so the ground and seedlings will dry considerably before nightfall.

CHEMICAL TREATMENT

As most of you have experienced, the chemical companies are reluctant to recommend any chemical for treating pine seed or soil for fungus control in our nurseries. They will tell you the experiences and recommendations for other crops. We, in Arkansas, have used Captan 75W seed treater and Samesan (from 6 to 12 ounces per 100 pounds of seed) with fair results in pre-emergence damping-off control. However, this does not sterilize enough soil around the plant, nor is it effective long enough to control fungus, if we have a prolonged germination period due to weather conditions.

As a soil treater, after the seed have been planted, we have used Captan 50W (10 to 30 pounds per acre) for post-emergence damping-off

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1/ Panel presentation. Papers of panel participants are included.

control. This gives fair results of damping-off at ground level. We have used Captan 10-10-10 (10 to 20 pounds per acre) with fair results. Due to methods of putting this material on the ground we don't feel it has given the proper protection. If it could be applied in liquid form, I would suspect the results would be much better because you could get a more even distribution than in dusting. The material should be used as a prevention instead of a cure. The Chemical Company has indicated that this could be used on field crops at 10 pounds per acre every 7 to 10 days without burning the plants. We understand through Stauffer Chemical Company that they are coming out with a Captan 4 Flowable, which contains 4 pounds of active ingredient per gallon of water.

We have not had sufficient results with Vapam, methyl bromide, and Vorlex to justify their use. Arasan 42S, with which we treat our seed for bird repellent, is also a fungicide. We have experienced little fungicide advantage in using this as a dual purpose chemical, apparently because we have to apply it to the seedcoat so tight it can't dissolve enough to sterilize the soil. After observing the experimental work on our nurseries done with fungicides, herbicides, and pesticides in conjunction with DuPont, Shell Oil Company, Buckman Laboratories, and Adkins-Phelps (a subsiduary of Air-Products) I invited Dr. Pulido of Buckman Laboratories to establish some experimental work with me in container grown stock to control fungus. After seeing the results of these experiments, I used Busan 72 this year on 6 of the 8 acres planted at Bluff City Nursery and on 12 acres at the Baucum Nursery. On the beds where it was used as a soil sterilant <u>immediately</u> after planting the seed (3.8 pounds in 120 gallons of water per acre), no damping-off was observed and germination was excellent.

On the trees that were germinated, we killed several but completely controlled damping-off with Busan 72. The surviving seedlings turned chlorotic and were stunted for about 45 days, but after that time they snapped out of it and are as healthy as the other plants.

Our plans, at present, are to use Arasan 42S as a seed treater for bird repellent, and treat our beds with Busan 72 (at the rate of 2 to 2½ pounds per 120 gallons of water per acre) as soon as the seeds are planted. This treatment will be effective for approximately 30 days. Further treatment will be used as recommended by Buckman Laboratories (Dr. Pulido).

We have made no tests on hardwood yet, but hope to make some next spring.