SURVIVAL AND GROWTH OF SELECT LONGLEAF PINE FAMILIES INOCULATED WITH PISOLITHUS TINCTORIUS AND TREATED WITH BENOMYL

Lott, L.H.[1], Mason, M.E.[1], Kubisiak, T.L.[1], and Kais,

[1]Supervisory Forestry Technician, Biologist, and Research Geneticist, USDA Forest Service, Southern Research Station, Southern Institute of Forest Genetics, 23332 Hwy 67, Saucier, MS 39574; [2]Retired, USDA Forest Service, Southern Research Station.

Abstract: The objective of this study was to determine the effects of Pisolithus *tinctorius* (Pt) ectomycorrhizae and benomyl on the survival and growth of select longleaf pine families. A total of four families varying in brown-spot resistance and growth potential were compared in this experiment: (l) Abe x wind; (2) 27-168 x wind; (3) 30-142 x wind; and (4) 5-77 x wind. Two of the families (Abe x wind and 27-168 x wind) have shown good brown-spot resistance and rapid early height growth, and the other two families (30-142 x wind and 5-77 x wind) are more susceptible to brown-spot and are slow growers. Nursery beds were prepared by treating in the spring with methyl bromide two weeks prior to inoculation and sowing of seeds, which was done on May 15. The Pt treatments were: (1) mycelium-vermiculite inoculum or Pt spore pellets applied 1-2 in. deep in a 2 in. wide band, or (2) no inoculum. The four families were completely randomized into five blocks for each treatment at sowing time. Seedlings were all lifted just prior to planting in January of the following year. At that time, a randomized sample of five seedlings from each family/treatment/block combination were evaluated for percent Pt. Only inoculated seedlings with >10% Pt infection were used. Seedlings were divided into pairs at the time of lifting. At planting, one seedling of the pair was root-treated with a 5% a.i. benomyl-clay mixture , while the other received plain clay. The planting consisted of 5 blocks x 2 Pt treatments x4 families x 2 root treatments x 5 seedlings for a total of 400 seedlings. Survival, total height, and percent brown-spot infection data were collected five years after outplanting. Analysis of the survival data did not suggest any significant interactions among the main effect variables. The benomyl treatment was found to significantly increase survival (Prob.>F=0.0231), 78% survival with benomyl versus 68% without benomyl. A significant family effect was also detected (Prob.>F=0.0474), with 74%, 80%, 75% and 63% survival for the four families, respectively. Analysis of the height growth data did not suggest any significant interactions, however, three of the main effect variables were significant. Family effects were highly significant (Prob.>F=0.0001), with mean heights for the four families of 127 cm, 183 cm, 109 cm,and 169 cm, respectively. The effect of the Pt treatment was significant (Prob.>F=0.0105), seedlings treated with Pt had an average height of 131 cm whereas seedlings not treated with Pt averaged le cm. The effect of the benomyl treatment was also highly significant (Prob.>F=0.0001), seedlings treated with benomyl had an average height of 198 cm whereas seedlings not treated with benomyl averaged 89 cm. Analysis of the brown-spot severity data identified a significant three-way interaction among the three main effect variables family*Pt*benomyl. In our poster we graphically present this data, point out some of the underlying interactions of the Pt and benomyl treatments on the various longleaf pine families, and discuss this data in terms of previous rankings of these families for brown-spot resistance and rapid early height growth.

Keywords: *Pinus palustris* Mill., *Pisolithus tinctorius,* benomyl, brown-spot