FLORIDA DIVISION OF FORESTRY
PINE NURSERY SEEDLING IMPROVEMENT STUDIES

An Outline of Highlights & Current Status

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Several studies have been initiated in Florida over the past four years to identify and correct problems contributing to unsatisfactory field performance of commercially grown bare-root pine seedlings. This brief report is intended only to provide interested parties with a synopsis of the type of studies being conducted and some key findings to date. Elaborate summaries of detailed data, etc., are omitted here for simplicity and, quite honestly, the lack of sufficient time to organize same into a meaningful and coherent package. Also, some of our studies are still in progress, making data summaries at this time premature. Readers with particular interest in or questions regarding specific aspects of these studies are invited to contact the author.

Comprehensive "Seedling Quality" Studies

Two years of seedling quality studies involving comparative analysis of seedling (slash pine) morphological and biochemical attributes in relation to field performance (survival & growth) on seedlings from five commercial forest nurseries have been conducted. All possible statistical analyses are not yet complete and field measurements are still being taken (through 3'rd year). Interesting results to date include:

1) higher root starch concentrations (mg/g root dry weight) in "late season" (i.e., February) as opposed to "early season" (i.e., December) seedlings,

2) better field survival for seedlings lifted and outplanted in December as opposed to February (suspect weather related),

3) generally poor survival (1'st year) of seedlings with "low" root starch as compared to companion seedlings (i.e., lifted on same date from different nursery and/or different seedbed within same nursery) with "high" root starch levels,

4) a possible association between low root starch reserves and a) excessive seedbed density and b) excessively high seedbed pH due to high levels of calcium in irrigation water,

5) a general increase in root mass and a concomitant decrease in shoot/root ratio in February-lifted seedlings as opposed to December-lifted seedlings.

Comparative Fumigation Trials

Early circumstantial evidence suggested possible adverse side effects on seedlings of seedbed fumigation with methyl bromide containing high levels of chloropicrin. Two years of seedling comparisons (morphology and field performance), however, have demonstrated no differences between seedlings grown in soils fumigated with methyl bromide formulations containing 2% or 33% chloropicrin.

Current efforts are being aimed at comparing (on the basis of pre- and post-fumigation sclerotial populations and/or viability) the relative efficacies of methyl bromide formulations containing 2 or 33% chloropicrin in controlling Macrophomina phaseolina, the cause of charcoal root rot.

Seedling Packaging - Comparisons of Selected Media

Survival of seedlings stored for varying lengths of time in peat moss was notably better than that for seedlings stored similarly in either Hydromulch® or Terra-Sorb®. Results of this study are not to be taken as a bottom line reality for all seedlings under all storage and/or handling conditions, but rather as an indicator of the potentials for microbial and/or aeration problems under certain conditions.

Current Efforts

Other investigations are under way in cooperation with various graduate students from the University of Florida. These studies are centering on a) root pruning, b) seedling life tables, c) solar pasteurization of seedbed soils, and d) cultural practices in relation Rhizoctonia needle blight(s) of longleaf pine. We are also in the second year of a U. S. Forest Service - funded statewide survey of sand pine seedbeds for Phytophthora cinnamoni in cooperation with Dr. R. S. Webb of the University of Florida's School of Forest Resourses and Conservation.

Note: These studies to date have been successful and show promise for considerably more positive accomplishments due primarily to the positive cooperation among Florida's Forest Industries and Dept. of Agriculture & Consumer Services, as well as the U. S. Forest Service, and the University of Florida.

Note: This paper was presented in two panel discussions in the 1982 Southern Nursery Conference--Savannah, Georgia.