

Does Fertilization and Competition Control Pay in Slash Pine Stands Growing on Deep Sands?

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INTRODUCTION

Slash and loblolly pine do not grow well on excessively well drained deep sands of the Coastal Plain and Sand Hills of Georgia. None the less many acres of these droughty, infertile soils are planted to slash and loblolly pine. A forest landowner in Wheeler County had a pre-merchantable, unthinned stand of 18-year-old slash pine growing poorly on such soils (Lakeland and Foxworth soil series) and questioned whether fertilization, herbicides, or the combination would enhance growth. Common understory woody plants included hawthorn (primary woody plant), turkey oak, water oak, post oak, southern red oak, and persimmon. Foliar sampling and analysis taken prior to fertilization and herbicide application indicated N (0.93 to 0.96%), P (0.085 to 0.095%), and K (0.17 to 0.20%) concentrations at or below sufficiency. Soil available P was slightly above sufficiency (14 to 26 lbs/ac) prior to treatments. Twelve gross treated plots (96x96 feet) were installed with an interior 66x66 feet measurement plot to follow tree growth. All living trees within each measurement plot were numbered and aluminum tree tagged and measured for dbh, live crown length, and total height prior to fertilizer or herbicide application. Plot treatments were: control (C; no treatment), fertilization (F) only (465 lbs NH₄NO₃, 250 lbs DAP, 100 lbs muriate of potash per acre = 155 N, 50 P and 50 K per acre), herbicide (H) only (Velpar L @ 2ml/spot in a 6x6 feet grid pattern), or the fertilization+herbicide (FH) combination. Treatments were randomly assigned to the plots. All treatments were applied on 22 March 2002.

RESULTS

Results after four years indicate the following: (1) two and four year mortality was excessive in the FH treatment (14%) compared to the other treatments (2 to 3%), (2) four year diameter growth was significantly greater in the F and FH treatments (0.76 and 0.78 inches) than in the C and H treatments (0.48 and 0.59 inches), and (3) there were no significant gains in height, live crown ratio, volume per tree, total volume, pulpwood, or superpulp volume/ac growth with the F, H, or FH treatments compared to the control over the four year period. Economically wood value gains were \$136/ac for the control, \$184/ac for the F, \$193/ac for the H, and \$158/ac for the FH treatments over the four year period. In this case, NPK fertilization, the herbicide application, and the combination did not pay. If fertilization and/or herbicide application had occurred at an earlier age would we have seen a benefit? It is possible. This case illustrates that slash pine is not the best choice on these infertile deep sands. Longleaf and sand pine are the best choices on these soils.

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