Effect of First Generation Genetic Improvement and Vegetation Control on Growth and Yield of Loblolly Pine after Twelve Years

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ABSTRACT

A designed experimental study was established at 16 locations in the Coastal Plain region of Georgia and northern Florida, and at 15 locations in the Piedmont region of South Carolina, Georgia, and Alabama. The objective of the study was to evaluate the impacts of first generation genetic improvement, and of combining genetic improvement and vegetation control on yields of loblolly pine. Two levels of competition were either none other than that provided by operational site preparation or complete control. Genetic improvement was either unimproved, bulk lot first generation improved stock or single family.

Total volume per acre was significantly increased by both improved genetics and competition control. Increases in total volume of 45% and 39% were obtained from complete vegetation control in the Coastal Plain and Piedmont regions respectively. Improved genetic stock (bulk lot or single family) increased total volume an average of 11% to 16% in the Coastal Plain and 10% to 19% in the Piedmont. These values are consistent with estimates from progeny tests. For both total and merchantable volume the effects of competition control and improved genetics were additive. In both regions, improved genetics significantly reduced the percent fusiform infection. No significant differences were detected between bulk lot and single family plantings across all dependent variables.

The results of a 3-yr periodic growth analysis indicated that the no competition control plots had significantly larger growth from age 9-12 than complete competition control plots for some individual tree variables. Over the same time period improved genetic stock continued to outgrow unimproved stock for these variables in both regions. For both regions, per acre volume growth was significantly increased by both competition control and improved genetics over the 3 yr period.