BENCHMARKING GAINS FROM PLANTING GENETICALLY IMPROVED LOBLOLLY PINE

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As loblolly pine (*Pinus taeda*) is the most important commercial tree species in the southeast US, much effort has been placed on selecting progeny with improved growth characteristics. Stands with different genetic backgrounds will lead to different stand characteristics over time. Straighter boles, fewer forks, and improved rust resistance are just a few examples of the types individual tree characteristics that tree breeding programs seek to improve. Developing a benchmark for comparison of improved genotypes is of importance so it can be determined if improvement gains are being met. The early selection open-pollinated (OP) loblolly pine family 07-56 has been widely planted across the southeast due to its fast growth. As such, it is a good candidate to act as a benchmark across the range where it has been planted.

The objectives of this study are to characterize OP family 07-56 stands across a range of sites and ages by describing diameter distributions, stem volume, and variability in individual tree traits. Data used for this study comes from five different unthinned block-plot Plantation Management Research Cooperative (PMRC) research trials located in the upper and lower coastal plain of GA, and the lower coastal plain of FL and SC.

Initially, the Kolmogorov-Smirnov test was used to determine if a two-parameter Weibull distribution was an appropriate fit for the diameter distributions. It was concluded that indeed a two-parameter Weibull distribution was appropriate for the data; shape and scale parameters were developed on the plot level. Shape and scale parameters were estimated following Bullock and Burkhart's (2005) methods in which age, basal area and trees per hectare were used to augment the models. Summary statistics of individual tree heights and diameters were determined on the plot level. Defects such as presence of fusiform rust, forking, and crook/sweep, decrease the quality, quantity, and value of sawtimber. Knowledge of the proportion of trees impacted in OP 07-56 by quality/value reducing defects is important for land managers; it can also be used as a mechanism of comparison for other improved loblolly pine genotypes therefore variables for rust and sawtimber quality were included in modeling efforts.

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