

IMPACTS OF SPACING AND GENETIC HOMOGENEITY ON GROWTH PATTERNS IN JUVENILE LOBLOLLY PINE

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There is a lack of information on the effects of genetic homogeneity on individual stem- and stand-level characteristics for loblolly pine. With the increasing acreage that is planted from a specific genetic family, research is needed to compare differences in growth patterns across varying levels of genetic homogeneity. In this study, we wanted to compare stand uniformity and productivity among loblolly pine genotypes of contrasting inherent genetic homogeneity while incorporating two planting densities. To examine genetic effects on stand uniformity and productivity, we grew ten different genotypes (three open-pollinated families, three full-sib families, three clones, and one seed orchard mix variety) in a plantation setting for 5 years, at two different planting densities (436 and 218 tree per acre). At age 5, average volume of the most productive genotype at the low planting density was 147% greater than that of the least productive genotype. Furthermore, the high density planting yielded similar results with a gain of 145% over the least productive genotype. Annual volume ranks among the genetic entries were consistent at the high planting density. In contrast, the volume ranks changed for many of the genetic entries at the low density planting. This suggests that there is genetic by spacing interaction taking place within many of the genotypes. More genetically homogenous genotypes did not show greater stand-level uniformity for height or diameter at breast height (dbh). Full-sib and open-pollinated genotypes had significantly lower CV's than the three clones, from age 1 to 5. However, the coefficient of variation for all genotypes decreased as age increased, suggesting genetic homogeneity may be more evident in phenotypes as trees mature.