

Genetic Control of Forking in Diallel Tests of Loblolly Pine

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Forking defects are probably the most serious stem-quality problems in loblolly pine. Our assessment of forking includes forked stems and ramicorn or steep-angled branches, which greatly reduces wood yield and wood quality. Assessing forking in elite pedigrees will enable us to more successfully breed and deploy non-forked phenotypes. The genetic control of forking and the correlation of forking to growth, stem straightness and fusiform rust disease traits were investigated in 6-year-old diallel tests, located throughout the Southeast. There were 122 diallel series (12 parents, 30 crosses \times 36 trees per cross per site \times 4 sites) with sufficient forking (average forking between 20% and 80%) for genetic analysis. From preliminary analyses in a subset of these diallel series, the half-sib family mean heritability for percent forking / ramicorn branching was about 0.77, as high as the heritability for height, fusiform rust resistance, and straightness. High heritability will result in high response of selection against forking. A threshold model will be fit to dichotomous data to understand underlying additive and non-additive genetic effects controlling forking in loblolly pine. Results from all 122 diallel series will be presented.