

## CORRESPONDENCE BETWEEN BREEDING VALUES OF THE SAME LOBLOLLY PINE GENOTYPES FROM CLONAL TRIALS AND HALF-SIB SEEDLING PROGENY TESTS

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In loblolly pine genetic trials, we expect that if seedlings are cloned, selection within families would be more efficient than selecting seedling progeny. In this study, 65 loblolly pine clones from 32 crosses were tested at four locations in the southern US. About seven copies of each clone were tested at each site. In order to compare the breeding values of 65 clones based on clonal tests with seedling progeny, about 40 wind-pollinated seedlings (half-sib progeny) of each the same 65 clones were later tested at four different location. For both the clonal trials and the progeny trials, tree height, diameter at breast height, and the incidence of fusiform rust disease caused by *Cronartium quercuum* f. sp. *fusiforme* were assessed at age four years. Individual-tree models were fit to partition observed phenotypic variance into genetic and environment effects. Breeding values of the same 65 genotypes were estimated both from the clonal trials and from half-sib progeny tests. Clones and their half-sib progeny did not differ for mean height and volume growth. However, fusiform rust disease differed between clones and their half-sib seedlings. On average half-sib seedlings had 23% more fusiform rust disease incidence than clones. For growth traits, the additive genetic variance based on cloned genetic tests was about 2.5 times greater than based on their half-sib progeny test. For fusiform rust incidence, the additive genetic variance was even greater (~6 times) for cloned tests compared to their half-sib progeny tests. Family-mean heritability estimates were 0.88, 0.82 and 0.95 for height, volume and fusiform rust incidence, respectively. Clone-mean heritability estimates were slightly higher than family mean heritability estimates. Correlations between breeding values of 65 genotypes obtained from clonal trials and seedling half-sib progeny were about 0.59, suggesting that the correspondence between breeding values from clonal tests is moderate for both growth and fusiform rust disease incidence in loblolly pine.