

GENETIC VARIATION AND CONTROL OF ANATOMICAL, CHEMICAL AND MECHANICAL WOOD PROPERTIES OF JUVENILE WOOD IN LOBLOLLY PINE

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Wood cores were collected from 3800 4-year old loblolly pine (*Pinus taeda*) trees from 2 sites in the CCLONES trail (Baltunis et al., 2007). Core wood density and latewood percentages were determined with x-ray densitometry, C6 and C5 carbohydrate as well as lignin contents of rings 3 + 4 were determined with pyrolysis molecular beam mass spectrometry, and wood velocity stiffness was measured both in isolated cores and in-trees in the field. Interestingly, substantial phenotypic variation was observed for wood properties. Wood lignin content in rings 3 + 4, varied from 21.3 to 35.6%. Wood carbohydrate peak height varied about two-fold for 5 and 6 carbon sugars and 5 plus 6 carbon sugars combined. Velocity stiffness ranged from 2.2 to 12.1(km²/s²) measured in standing trees in the field and 1.8 to 21.4 (km²/s²) measured in the lab with dried 5 mm increment cores. Specific gravity (SG) varied from 0.184 to 0.518 for whole cores, 0.337 to 0.498 for year 3 and 0.229 to 0.554 for year 4. Latewood and earlywood SG ranged from 0.352 to 0.677 and 0.165 to 0.444 for year 3 and from 0.289 to 0.748 for latewood and 0.130 to 0.454 for earlywood in year 4. Latewood percentage varied from 1.68 to 53.32 in year 3 and 1.44 to 66.82 in year 4. Genetic parameters - clonal repeatability, narrow sense heritability, additive, dominance and epistatic components – and pairwise genetic correlations were computed and will be reported for all wood properties.