Introgression of Loblolly pine genes into a Slash pine Background

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A pseudo-backcross of (P. elliottii x P. taeda) x P. elliottii was made in 2005 in order to facilitate the introgression of loblolly pine into a slash pine background. These backcross plants (BC1) along with open-pollinated families of the pure parental species of the F1 hybrid (slash1 and Loblolly1) and recurrent parent (slash2) were planted in a trial at High Springs, Florida. Fourteen repeated height and disease measurements were taken in the first growing season and a suite of crown architecture traits were measured at the end of the growing season. The results of these measurements indicated that introgression of loblolly genes into slash pine was a success. Positive heterosis was found for all growth traits, but negative heterosis occurred for phenological variables examined except for initiation of the growth. The BC1 and Slash2 had the largest rate of growth. However, the larger duration of growth for Slash2 produced the largest family in the test. The BC1 ceased growth the soonest. The tip moth incidence in the BC1 (20%) was a result of the influence of the loblolly pine genes (54% incidence for Loblolly1) given that the slash pine families had a uniformly low incidence (10 and 11%). The level of tip moth incidence is another indication that introgression was successful because the F1 closest resembled loblolly pine for tip moth incidence. Difference among taxa were significant (p-value<0.05) for crown architecture traits. BC1 showed negative heterosis for diameter (measured at the base of the tree), performing below the average of its parents. For number of branches and number of nodes, the BC1 did not show heterosis, indicating that carefully chosen parents could influence the level of these traits in backcrosses. Slash pine families have a thicker diameter at the top of the plant than loblolly pine while the BC1 performed at the parental average. In conclusion, the BC1 had a different tree architecture compared to the pure species. It was taller with lower diameter than the parental average and performed the average of its parents with regard to the number of branches, number of nodes and tip moth incidence.

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