

GROWTH PERFORMANCE OF LOBLOLLY, SHORTLEAF, AND PITCH X LOBLOLLY PINE HYBRID GROWING ALONG THE WESTERN MARGIN OF COMMERCIAL PINE RANGE

Dipesh K.C., Rodney E. Will, Thomas C. Hennessey, Thomas B. Lynch, Robert Heinemann, and Randal Holeman¹

Expansion of the commercial pine range is one of the opportunities to improve forest production and counterbalance the loss of forest land to other uses. The potential genotypes for the purpose are fast-growing loblolly pine (*Pinus taeda* L.), the slower growing, but more drought tolerant shortleaf pine (*P. echinata* Mill.), and the more cold tolerant pitch x loblolly pine hybrid (*P. rigida* x *taeda*). An uncertainty regarding the effect of potential climate change on the future commercial range of pine plantation also calls for the detailed information on survival and growth performance among the potential genotypes planted at the margin of the range.

Our objectives were to compare survival and growth of loblolly pine, shortleaf pine, and pitch x loblolly hybrid pine planted in southeastern Oklahoma. The study was established in spring 2002 at 4 sites in southeastern Oklahoma within the natural range of shortleaf pine and loblolly pine, as well as west and north of the loblolly pine natural range. Three replications were planted with 1-0 seedlings of loblolly pine, shortleaf pine and pitch x loblolly pine (F1 hybrids) at each location at an approximate density of 1,343 trees ha⁻¹. Height and diameter were measured periodically until age 10, except after 6th, 7th, and 8th growing seasons. After the 8th growing season, every other tree was selected in the loblolly and pitch x loblolly pine

stands at the Idabel site for thinning. Survival of 8-year-old trees from Idabel were compared with 9-year-old trees from other sites; height and diameter of the genotypes across all sites were compared after the 10th growing season.

Average survival of loblolly, shortleaf, and pitch x loblolly hybrids were 70, 59, and 71 percent respectively. After 10 years, the loblolly pine was tallest (9.4 m), pitch x loblolly pine hybrid second tallest (8.3 m), and shortleaf the shortest (6.8 m). Diameter at breast height followed the same pattern as height with loblolly pine 16.5 cm, pitch x loblolly pine hybrid 14.2 cm, and shortleaf pine 11.8 cm. These results indicate that loblolly pine outperformed both shortleaf and pitch x loblolly pine hybrids when planted at the western edge of the commercial southern pine range.

ACKNOWLEDGEMENTS

We thank Oklahoma Agricultural Experiment Station for the funding. We would also like to express our sincere thanks to Keith Anderson, Fernanda Bortolheiro, Greg Campbell, Edward Lorenzi, and Dennis Wilson for their assistance during data collection and plots establishment.

¹Graduate Student, Associate Professor, Professor, and Professor, respectively, Oklahoma State University, Department of Natural Resource Ecology and Management, Stillwater, OK 74078; and Senior Superintendent and Research Specialist, respectively, Oklahoma State University Kiamichi Forest Resources Center, Idabel, OK 74745.