

**THE EFFECT OF COVER CROP AND FERTILIZER RATE
ON THE GROWTH AND SURVIVAL OF LOBLOLLY PINE
IN EAST TEXAS MINE SPOIL**

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Two studies were initiated in August, 1978 at the Martin Lake lignite mine site in Panola County, Texas. The objective of these studies was to determine the effect of cover crop and N and P fertilizer rates, used to prevent soil erosion, on the survival and growth of loblolly pine planted in mine spoil. Coastal bermudagrass, fertilized with O, 50 or 100 kg N/ha/year, was used in the N study. Dixie crimson clover, Yuchi arrowleaf clover, Mount Barker subterranean clover, Kobe lespedeza, crimson-lespedeza mix, subterranean-lespedeza mix, Gulf ryegrass, Gulf ryegrass + 100 kg N/ha/year, no cover and no cover + 100 kg N/ha/year, fertilized with O, 25 or 50 kg P/ha, were evaluated in the P study.

Competition between cover crops and trees for light, water and nutrients influenced survival and growth of trees. Tree survival, after three years, was greatest in the subterranean clover (42%), Coastal bermudagrass + 50 kg N/ha/year (45%) and Coastal bermudagrass + 0 kg N/ha (39%) plots. The highly competitive crops, Coastal bermudagrass + 100 kg N/ha/year and arrowleaf clover, had the lowest tree survival (14% and 13%, respectively).

Mean tree height was greatest in those plots receiving applied N [ryegrass + 100 kg N/ha/year (108 cm) and no cover +100 kg N/ha/year (98 cm)] or N input from highly productive legumes such as arrowleaf clover (106 cm). These plots also had the lowest survival. Tree height was least in plots with the greatest heat and moisture stress [lespedeza (81 cm), ryegrass (81 cm) and crimson clover-lespedeza (80 cm)] in 1980 and 1981.

The regulations of the Texas Railroad Commission require a minimum of 1148 healthy trees/ha and 70% ground cover for successful reforestation of surface mineral sites. Subterranean clover + 50 kg P/ha met these requirements best with 1461 trees/ha and 91% ground cover after three years. Coastal + 50 kg N/ha/year had 1389 trees/ha and 100% ground cover. The moisture stress provided by Coastal, however, resulted in smaller and less vigorous trees.

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