LOBLOLLY BEST BUT SEED SOURCE IMPORTANT IN EROSION-CONTROL PLANTINGS IN NORTH MISSISSIPPI

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Growth of loblolly pine (Pinus taeda L.) from four seed sources has differed markedly in 5-year-old erosion-control plantings in north Mississippi. Differences among sources have been consistent on two major problem soils in this area--deep droughty sands and eroded Coastal Plain subsoils. The poorest loblolly source has outperformed shortleaf (P. echinata Mill.) from two sources and Virginia and sand pine (P. virginiana Mill. and P. clausa (Chapm.) Vasey) from single sources. These early results are of interest because fast growth is necessary in erosion-control planting to quickly stabilize surface soil.

Seedlings were grown in a single nursery bed at Crossett, Arkansas, and were outplanted near Oxford, Mississippi, in 1957 in a randomized block design. Six blocks, each consisting of 8 treatment plots, were established on each soil. Treatment plots contained 36 seedlings at a 5- by 5-foot spacing.

Shortleaf grew the least (table 1). Trees from seed collected on dry sites in Oklahoma performed the same as those grown from local seed. Both sources grew 31 percent less than the poorest loblolly.

Every tree in the study was infested with tip moth (Rhyacionia frustrana) by the end of the fifth growing season. Loblolly pine was least damaged and quickly outgrew any permanent effects. Shortleaf sustained the greatest damage, often becoming misshapen and scrubby.

Among the four loblolly seed sources, trees from seed, collected on one of the Lost Pine islands in Caldwell County, Texas, grew tallest; trees from Crossett seed grew least. Differences between the Lost Pines and the average of the other sources were significant at the 1-percent level. Trees from sources in northwest Georgia and east Texas grew about the same, and their average height growth was significantly better

TABLE 1.--Survival and height growth after five growing seasons

Species or source	Survival		Height growth	
	Sandy sites	Eroded sites	Sandy sites	Eroded sites
Loblolly:	*Percent*	*Percent*	*Feet*	*Feet*
Lost Pines	97	82	12.0	8.1
East Texas	95	80	10.6	6.2
Northwest Georgia	92	87	10.0	6.4
Crossett	93	71	9.0	5.7
Sand pine	70	75	8.7	4.5
Virginia pine	87	84	7.4	4.8
Shortleaf:				
Oklahoma	89	76	6.3	3.8
Local	84	80	6.9	3.5

(at the 5-percent level) than that of the Crossett trees. Survival was uniformly high among the four loblolly sources, and superior at the 5-percent level of significance to the average of the other three species.

Sand pine had poorer survival than Virginia pine, but height growth was essentially the same. The two species outgrew shortleaf (1-percentlevel of significance) but averaged 1.06 feet less in height than the poorest loblolly.

Sand pine should not be planted in this area. It had the poorest survival of all species and continued to sustain losses from winterkill into the fifth growing season, long after losses in the other species had ceased. Surprisingly, it was the only species to have a higher mortality on sandy soil than on subsoil. Survival of the other species was 11 percent greater on sandy soils.

Height growth of all species averaged 3.5 feet less on subsoils than on sands. The poor performance is attributed to a high soil density which greatly retards root growth on eroded subsoils--often to such an extent that site preparation is necessary to establish any plant species.

The experience recorded here adds support to the current practice of using loblolly exclusively for erosion-control plantings in the upper Midsouth. Results indicate the existence of superior geographic strains of loblolly, and suggest the need to determine if watershed values would justify such strains for special problem soils.