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A COMPARISON OF SIX SPECIES OF SOUTHERN PINES PLANTED IN THE PIEDMONT OF SOUTH CAROLINA

Abstract.--Six species of southern pines were planted on a Piedmont site in South Carolina. Comparisons were made among species for height, d.b.h., and survival at 13 years. Loblolly pine grew best, but slash pine could be substituted with little growth loss. Shortleaf pine was slightly lower in growth and survival when compared with loblolly pine. Virginia, longleaf, and eastern white pines compared so poorly with the other three species that they probably would be regarded as economically unimportant for timber production.

The relative rates of growth and survival among species of southern pines planted in the Piedmont are of interest to foresters for several reasons. Primarily, there is always the danger in monoculture that the species may become susceptible to one or more diseases and that an alternate species may be desired. Second, trees are planted many times for purposes other than timber production (Christmas trees, highway planting, esthetics), and the larger or faster growing species may not be preferable.

In January 1957, loblolly pine, slash pine, shortleaf pine, longleaf pine, Virginia pine, and eastern white pine were planted on an old-field site in the Piedmont near Union, South Carolina. The study consisted of three blocks. Each block contained six plots, one for each species. The trees were planted at a spacing of 8 by 8 feet with 12 rows of 12 trees in each plot. Only the inner 64 trees (8 rows of 8 trees) were measured.

In March 1970, after the 13th growing season following planting, height, diameter, and survival were taken on all measured trees in the study. The data show that loblolly and slash pines have been the most successful species (table 1). There was no significant difference in height, diameter, or survival between slash and loblolly pines at the 5-percent level. Shortleaf pine ranked third but was significantly different in height and diameter from slash and loblolly pines. There were no significant differences in survival among loblolly, slash, and shortleaf pines. Table 2 compares the relative success of the other five species with loblolly pine. The latter was assumed to be the most successful.

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Table 1.--A comparison of mean height, d.b.h., and survival among six species of planted southern pines after 13 growing seasons

Common and scientific names	Average[1]		
	Height	D.b.h.	Survival
	Feet	Inches	Percent
Loblolly pine (Pinus taeda L.)	41.57 a	6.20 a	97 a
Slash pine (P. elliottii Engelm.)	40.67 a	6.45 a	94 a
Shortleaf pine (P. echinata Mill.)	30.63 b	5.34 b	92 a
Longleaf pine (P. palustris Mill.)	27.33 b	4.33 c	75 b
Virginia pine (P. virginiana Mill.)	22.43 b	4.82 b c	64 b c
Eastern white pine (P. strobus L.)	19.33 b	3.54 d	50 c

[1]In each column, all means not identified by a common letter are significantly different at the 5-percent level of probability.

Table 2.--Relative success of five species of southern pines compared with loblolly pine

Species	Height	Diameter	Survival
	Percent		
Loblolly pine	100	100	100
Slash pine	98	103	97
Shortleaf pine	74	83	95
Longleaf pine	66	69	77
Virginia pine	54	77	66
Eastern white pine	46	56	52

All measurements include replants that were planted at the end of the first growing season. Some of these replants were from border rows of the original planting, and some were nursery seedlings of that year. No records were kept of trees that were replanted.

The plots of both longleaf and eastern white pines contained many volunteers of loblolly and shortleaf pines. Plots of the other four species contained relatively few volunteers. Apparently, longleaf and eastern white pines are not as capable of competing for light, moisture, and nutrients as are Virginia, shortleaf, slash, and loblolly pines. Stands of eastern white and longleaf pines would probably need periodic cleaning if pure stands of either were desired.

Infection from fusiform rust (Cronartium fusiforme Hedgc. & Hunt ex Cumm.) was very light over the entire study. The plots of slash pine had 5 percent of their stems infected, and the plots of loblolly pine had only 2-percent stem infection.

One may conclude from this study that slash pine could be substituted for loblolly pine on similar Piedmont sites with little or no loss in growth. Shortleaf pine may be planted, but one can expect a slight decrease in growth and survival. Virginia, longleaf, and eastern white pines compare so poorly with the other three species that they would probably be regarded as economically unimportant for timber production.

All six species should fit in a highway beautification program. With their variety of growth rates and tree forms, the six species could be planted in combination to improve the appearance of rights-of-way and median strips. Longleaf, shortleaf, Virginia, and eastern white pines could also be planted as ornamentals or Christmas trees.

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