

PLANTING LONGLEAF PINE IN THE CAROLINA SANDHILLS

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For the last 30 years in the Carolina sandhills, slash pine (*Pinus elliottii* Engelm.) has been planted almost exclusively, and with tremendous success. Recently, however, root rot caused by *Fomes annosus* has appeared in thinned stands, and foresters have re-examined the native longleaf pine (*P. palustris* Mill.). In comparison to slash pine, longleaf

is more difficult to plant and grows slower. This study shows what the prospective longleaf planter can do to solve some of the problems confronting him.

Methods

The study was begun in 1953 at Manchester and Sand Hills State Forests by the South Carolina State Commission of Forestry and the Southeastern Forest Experiment Station. Deep sand scrub oak sites were cleared and thoroughly disked before planting. Since then,

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oak sprouting has been controlled to permit adequate evaluation of treatments.

Seedlings were planted in December 1953, and January and March 1954. Each season's planting was divided into four blocks containing 12 treatments. Treatments consisted of all possible combinations of two seedling grades (Wakeley's grades 1 and 2 for longleaf pine) (1), three root-pruning lengths (3, 5, and 7 inches, pruned after lifting), and two foliage clipping levels (clipped to 5 inches and unclipped).

Results and Discussion

At the end of the first year the seedlings planted at Manchester State Forest had an overall survival of only 9 percent. This almost complete failure can largely be attributed to too brief a stabilization period after disking. The optimum interval between disking and planting depends on soil and amount of organic debris. Our experience indicates that at least 90 days should elapse. Dragging with heavy crossties or other suitable implements reduces the time needed for stabilization.

Freezing is another hazard. At the Sand Hills State Forest a severe freeze occurred shortly after the December planting; seedling survival averaged only 17 percent. Planting should be deferred until after hard freezes usually occur.

Enough of the seedlings planted in January and March at Sand Hills State Forest survived to indicate how grading, foliage clipping, and root pruning affect survival and growth. Unfortunately, seedlings were planted on a relatively poorer site in January than in March. Therefore, direct comparison could not be made between the two plantings. Some pointers can be drawn, however, from the results of the other treatments (table 1).

Grading the seedlings improved growth but did not affect survival. By the end of the fifth year grade 1 seedlings averaged 0.7 foot taller than the grade 2 seedlings and more grade 1 than grade 2 seedlings were out of the grass stage, a very important factor in growing longleaf pine.

TABLE 1.--Average fifth-year survival and height of longleaf pine seedlings by treatments

Treatment	Survival ¹	Height ¹
Grading:	<i>Percent</i>	<i>Feet</i>
Grade 1.....	58]	4.5
Grade 2.....	59]	3.8
Foliage clipping:		
Clipped foliage.....	69	4.1]
Unclipped foliage.....	49	4.2]
Root pruning:		
3 inches.....	46	4.0]
5 inches.....	65]	4.3
7 inches.....	65]	4.2

¹ Differences between figures enclosed in brackets were not significant at the 5 percent level.

Clipping longleaf pine needles at planting time increased survival significantly without decreasing growth. This is not a new finding (2), but it bears repeating because longleaf pine needles are not usually clipped in most nurseries.

On the other hand, root pruning to 3 inches sharply reduced survival. More moderate root pruning, to 5 inches, did not affect survival or growth. Root pruning makes it easier to plant seedlings and is commonly practiced.

In summary, this study reaffirms the desirability of clipping longleaf foliage to improve survival, and of planting grade 1 seedlings to obtain the best growth. Root pruning to 3 inches is not recommended, but more moderate root pruning will not significantly reduce survival or growth.

Literature Cited

- (1) Wakeley, Philip C. 1954. Planting the southern pines. U.S. Dept. Agr. Monog. 18, 233 pp., illus.
- (2) Allen, R. M. 1951. Clipping and dipping reduce longleaf mortality. U.S. Forest Serv. South. Forest Expt. Sta., South. Forestry Notes 71.