

Planting Small Slash Pine Seedlings

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Are small seedlings worth planting?

This question has troubled nurserymen and tree planters through the years. Now, with nurseries straining to meet the planters' demand for more trees, there is an urgent need for improved utilization of available planting stock. A recent study in the South Carolina Sandhills showed that small slash pine seedlings can be outplanted successfully even on harsh sites.

This is how it was done. Small slash pine seedlings were planted at various depths in furrowed old fields. Survival improved with depth of planting; those planted to the bud survived best, averaging over 90 percent in spite of a serious spring drought during the first growing season. Seedling growth followed the pattern of survival.

The foregoing results were obtained from experimental plantings by technicians of the Santee Research Center in cooperation with the Project Forester, Savannah River Project, Atomic Energy Commission, near Aiken, South Carolina. Three plots were laid out in three locations, each representing a soil type (deep sand, loamy sand, and sandy loam). All plots were prepared by means of furrows plowed six feet apart with a Sieco disk plow about 45 days before planting. The trees were hand planted in early February at six foot intervals in moist soil.

The 1-0 planting stock from a local seed source was grown at the U. S. Forest Service's Stuart Nursery, in Louisiana. About five days elapsed between lifting and planting during which the trees were held in the shipping bundles. Part of the seedlings were larger (morphological Grade 2) to check against the performance of the smaller (morphological Grade 3) seedlings. Inasmuch as the latter grade of slash pine seedlings includes all those which do not qualify for a better grade, the differences between seedlings may be rather wide. To get around this, a number of subgrades were established. The general specifications for these and the Grade 2 seedlings may be described as follows:

Seedling grade (No.)	Seedling subgrade	Average shoot length (Inches)	Average stem diameter (Inches)	Root development
2	--	12	1/8 or larger	fair to good
3	A	10	less than 1/8	fair to good
3	B	8	less than 1/8	fair to good
3	C	6 or less	less than 1/8	fair to good
3	D	6 or less	less than 1/8	poor

Grades and subgrades of slash pine seedlings tested in depth of planting experiment. Seedlings A, B, C and D are subgrades of morphological Grade 3

A total of 3,375 trees were planted in this experiment. Of these, equal numbers were planted at one of three depths: (1) set at same depth as in nursery; (2) set half-way between nursery depth and bud; and (3) set 1/2-1 inch below growing tip (just below growing tip or bud).

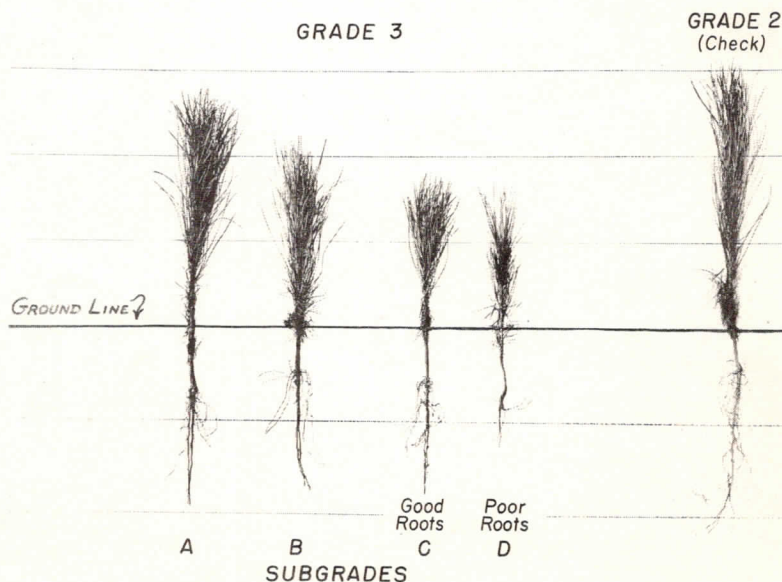
A 54-day drought in May and June severely tested the survival ability of the planted seedlings. Except for a half-inch rain and a few light showers, no precipitation fell during the period. Weather conditions were generally favorable during the remainder of the first growing season.

Survival counts made in November showed very little variation in results between different soil types. Consequently the data are combined and presented in table below. Regardless of grade, all trees benefitted by planting deeper than they grew in the nursery and those planted to the bud survived best. Small trees were helped most, especially the smallest and poorest seedlings (subgrade 3P) whose survival was doubled by planting to the bud.

FIRST YEAR SURVIVAL AND GROWTH OF SLASH PINE SEEDLINGS BY GRADE AND PLANTING DEPTH

Seedling grade	Depth of planting					
	Standard		Half-stem		To-bud	
	Survival (Percent)	Height growth (Inches)	Survival (Percent)	Height growth (Inches)	Survival (Percent)	Height growth (Inches)
Grade 2	82	4.9	92	5.7	98	8.9
Grade 3:						
Subgrade A	60	3.5	80	3.8	95	5.5
Subgrade B	70	3.2	80	3.4	93	4.8
Subgrade C	81	3.3	87	3.7	95	5.4
Subgrade D	43	2.5	64	2.6	89	3.8
All grades	67	3.5	81	3.8	94	5.7

Growth, too, was improved by deep planting. Although the effect was more marked among the Grade 2 seedlings, the in-



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creased height growth during the first growing season was significantly improved among all trees by planting to the bud.

Unfortunately, the experiment did not include trees planted without site preparation, as they often are. Whether the difference in survival and height growth will be as marked in unfurrowed, or otherwise unprepared sites, will have to be determined by additional experiments. In the meantime, we do know that deep planting slash pine in furrows materially helps small seedlings overcome the natural handicaps of size and vigor and thus improve the chances of successful plantation establishment even on the tough sites of the Carolina Sandhills. Planting stock available to the Savannah River Project may include as much as 50 percent Grade 3 slash pine seedlings. Obviously the total cost of reforesting this area should be appreciably reduced by applying this new information on (now that we know) how to plant small slash pine.

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