

Comparison of 1-0 and 2-0 Loblolly Pine Seedlings

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Surplus 1-0 loblolly pine seedlings can be top-pruned, kept in the nursery for a 2nd year, and planted with acceptable survival rates. First-year survival was 96 percent for 1-0 seedlings and 76 percent for 2-0 stock.

The Louisiana Office of Forestry had several million unsold loblolly pine seedlings in its nurseries in the spring of 1977. Unsold seedlings in Louisiana's State nurseries are usually retained in beds through the second growing season as part of soil management and then plowed under in late summer or early fall. In 1977, however, instead of plowing the trees under, they were top-pruned with a hammer-knife mower in late June or early July and again in August. No root pruning was done the 2nd year. New growth consisted of multiple tender sprouts when seedlings were lifted in December 1977. Before lifting these seedlings, the question arose concerning their survival and growth compared with conventional 1-0 seedlings. Consequently, a study was installed to compare the survival and growth of 1-0 and 2-0 seedlings.

Methods

All seedlings were grown in the Louisiana Office of Forestry's Columbia Nursery at bed densities of 270 per square meter (25/ft.²) with similar cultural treatments. The 2-0 stock was grown from 1973 woods-run seeds collected in Louisiana, while the 1-0 seedlings were grown from similar seeds harvested in 1972. The 1-0 and 2-0 seedlings were lifted on December 8 and 9, 1977, respectively, and stored at 2° C until handplanted on the J. K. Johnson Tract in Rapides Parish on December 12.

Five rows of 25 seedlings each were planted for each age class. Spacing was 1.2 meters within rows, which were 1.7 meters apart. The planting area had been disked and root-raked sev-

eral years earlier to prepare for a brush nursery. Grass, weeds, and small bushes were bush-hogged shortly before planting. Root collar diameters and seedling heights were measured at time of planting. Survival and height measurements were taken at the end of the first and second growing seasons. All data were subjected to analyses of variance to compare 1-0 and 2-0 seedlings. Differences were tested for significance at the 0.05 level.

Results and Discussion

Although differences in seedling heights were not significant at time of planting, averaging 12 to 13 centimeters (table 1), the 2-0 stock had multiple, tender sprouts. Initial root collar diameters of 2-0 seedlings

Table 1.—*Measurement data and survival of planted 1-0 and 2-0 loblolly pine seedlings*

	1-0 seedlings	2-0 seedlings
Root collar diameter when planted (mm)	3.9	5.3
Height when planted (cm)	12	13
1st-year survival (%)	96	76
1st-year height (cm)	28	19
2nd -year survival (%)	95	75
2nd-year height (cm)	55	42

were significantly larger than for 1-0 stock.

Survival of 1-0 seedlings averaged 96 percent after the 1st year, while 2-0 seedlings averaged 76 percent. Although this difference was significant, survival of the 2-0 seedlings is considered acceptable. The spring of 1978 was the driest on record for central Louisiana with only 1.77 inches of rainfall in March and only 0.44 in April. Subsequent rainfall during

the growing season was adequate. Survival of each seedling class declined by only one percentage point during the second growing season. The 1-0 stock averaged 95 percent, while survival for the 2-0 class was 75 percent.

Seedling heights for the 1-0 stock were superior to the 2-0 stock after one and two growing seasons. This is attributed to the multiple stems for 2-0 seedlings during the

1st year. After 2 years, however, a single stem dominated on all 2-0 seedlings. Unfortunately, growth of both classes was reduced by tip moths, which attacked nearly every seedling.

Results of this study demonstrate that acceptable survival percentages can be obtained with 2-0 loblolly pine seedlings that have been top-pruned, but survival and height growth may be less than for 1-0 stock.