Loblolly Pine Growth Topped!

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The 1968 Christmas Issue of the SOUTHERN LUMBERMAN carried our article—"Can You Top This Loblolly Pine Growth?"—in which we challenged our readers to find an example of pine growth better than that on our "wonder" plot. This 1/100-acre plot averaged 47 feet tall at 10 years and had merchantable volume estimated at 39.75 cubic feet. We received many comments about this phenomenal growth, and our challenge was answered in September 1970 by Henry B. Fishburne, Consulting Forester of Charleston, South Carolina. He reported on his one-acre plot with dominant and co-dominant trees averaging 54 feet at 11 years (really only 10½ years). This is seven feet taller than trees on our small "wonder" plot were at 10 years and at least two feet taller than ours at 11 years.

Fishburne's one-acre plot is in a 30-acre loblolly pine plantation established in January 1960 for a client on Wadmalaw Island, South Carolina. The seedlings came from the Westvaco forest tree nursery, and the seed was of local origin from the company's seed production areas. The plantation is in an old field which had been farmed the year prior to planting. During the first year after planting, the area was cultivated to reduce competition from weeds, and beds were formed eight to 10 inches high and eight feet wide.

We examined Fishburne's plot and verified that, indeed, the growth of his trees topped ours. Also, this phenomenal growth was not by any means confined to this one-acre plot; at least a fourth and perhaps more of the plantation was making equivalent growth. Stand characteristics are shown in detail in Table 1. The original spacing was six by eight feet, or 908 trees per acre. Mortality (about 30 per cent) since planting has reduced the number on the one-acre plot to 639. Although dominance was being expressed in this stand, difference in the average height of the suppressed trees (43 feet) and the dominant and co-dominants (54 feet) was only 11 feet. This illustrates that even the suppressed trees had grown quite rapidly. Ninety per cent of the trees were six inches in diameter or larger, and 20 per cent (or 130 trees on the acre) were nine inches or larger. Two trees reached 11 inches in diameter (Figure 1). The acre had 193 square feet of basal area, or an average growth of 17.5 square feet per year since planting. Merchantable cubic volume to a four-inch top was estimated to be 3,165 cubic feet, or about 48 cords per acre. One-third of this volume was in nine-inch or larger trees, and less than three per cent of the volume was in four- and five-inch trees. All trees on the acre averaged 7.5 inches in diameter. The stand is almost completely free from competition; in fact, only a few small plants are scattered beneath the dominating pines (Figure 1).

TABLE 1.—*Stand table of Fishburne's one-acre plot in a 30-acre loblolly pine plantation on Wadmalaw Island, S. C.*

Diameter class (inches)	*Number of trees*	*Basal area*	*Merchantable cubic volume, o.b.*	*Cordwood volume*	*Crown class*[1]	*Average total height*[2]
		(Sq. ft.)	*(Cu. ft.)*	*(Cords)*		*(Feet)*
4	17	1.5	9.7	0.19	S&I	43
5	43	5.9	62.3	1.06	I	45
6	124	24.3	326.1	4.71	I	45
7	161	43.0	668.1	10.64	I&CD	47
8	164	57.3	979.1	15.38	CD&D	52
9	102	45.1	821.1	12.30	D	56
10	26	14.2	272.0	3.67	D	55
11	2	1.3	26.3	0.34	D	55
Total	639	192.6	3,164.7	48.29	—	—

[1]Diameter class estimate based on classification of samples trees: S = suppressed, I = intermediate, CD = co-dominant, D = dominant.
[2]Based on sample tree heights.

FIGURE 1.—*The tree being measured was 11 inches in diameter and 55 feet tall 11 years after planting. Another tree on the acre was the tallest at 59 feet, but its diameter was smaller.*

Examples of growth of this magnitude are interesting, not only because they serve to set realistic goals for wood production, but because important leads may be obtained on some of the factors that contributed to such rapid growth. Certainly the seedling stock and seed origin must have played an important role in the generally good growth of the 30-acre plantation, as did the early cultivation that helped control com-

[1]Bobby Long, Soils Specialist with the Soil Conservation Service at Moncks Corner, S. C., identified the soil and provided other useful information about it.

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petition. Also, differences in growth are observable within the plantation. For example, height measurements of dominant trees in three other parts of the plantation showed average heights of 35, 39, and 45 feet. Obviously, these differences are largely soil-related, if we assume that past cultural practices have been equal over the whole field. If this assumption is correct, the soil and its chemical and physical properties and water relations are important factors contributing to this outstanding growth. The soil on the one-acre plot was classified as Seabrook loamy fine sand developed from sandy sediments of the First Marine (Pamlico) Terrace.[1] The inherent fertility of Seabrook soils for agricultural crops is moderately low; however, those occurring on the Sea Islands (such as Wadmalaw) contain more calcium and available phosphorus and have a thicker topsoil (12 inches) than somewhat similar soils on higher marine terraces. Also, the water table ranges from two to six feet and is commonly about four feet from the soil surface.

In summary, we think a growth record has been set for young loblolly pine. Eleven years after planting, dominant trees on Fishburne's one-acre plot averaged 54 feet in height, 130 trees on the acre were nine inches or larger and two were 11 inches in size, and estimated merchantable volume growth was 3,165 cubic feet, or about 48 cords.

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