

LOCAL SOURCES OF LOBLOLLY PINE IN MARYLAND AND SHORTLEAF PINE IN NEW JERSEY OUTGROW SOUTHERN STOCKS

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In 1951, the Committee on Southern Forest Tree Improvement initiated the Southwide Pine Seed Source Study. As part of the study, the Northeastern Forest Experiment Station established a loblolly pine plantation in eastern Maryland in 1953 and a shortleaf pine plantation in southern New Jersey in 1958. Each plantation contains seedlings from several geographic sources. Survival and growth differed markedly, depending upon the source.

Study Methods

Seed for the loblolly pine plantation in Maryland came from one Maryland source and eight more southern sources (table 1). Seedlings were grown in the Maryland State Forest Nursery at Harmans. They were then planted as 1-0 stock in a field, tilled the previous year, in the Pocomoke State Forest, Worcester County, Md.

TABLE 1.--Height, diameter, and survival of loblolly pine seedlings in a Maryland plantation, by geographic source

| Source | Height | | | Diameter at breast height after 10 growing seasons ² | Survival after 10 growing seasons |
|--|---------------------------|--------------------------|------------------------|---|-----------------------------------|
| | When planted ¹ | After 10 growing seasons | | | |
| | | Average ² | Dominants ³ | | |
| | <u>Inches</u> | <u>Feet</u> | <u>Feet</u> | <u>Inches</u> | <u>Percent</u> |
| Somerset County, Md. . . | 6.3 | 27.6 | 31.6 | 4.7 | 86 |
| Pamlico County, N.C. . . | 8.1 | 25.6 | 29.6 | 4.6 | 85 |
| Cullman County, Ala. . . | 5.8 | 24.2 | 28.2 | 4.6 | 85 |
| Onslow County, N.C. . . | 8.7 | 24.1 | 28.0 | 4.3 | 80 |
| Jefferson County, Ala. . . | 6.7 | 24.0 | 27.3 | 4.4 | 89 |
| Clark County, Ark. . . . | 5.2 | 23.9 | 27.0 | 4.6 | 94 |
| Angelina County, Tex. . . | 8.0 | 21.8 | 26.6 | 4.3 | 80 |
| Wilcox and Crisp Counties, Ga. | 8.7 | 21.4 | 26.2 | 4.2 | 66 |
| Livingston Parish, La. . . | 6.3 | 19.1 | 24.2 | 3.6 | 64 |

¹ Average height of living portions of stems. Portions killed by winter injury are not included.

² Average of all surviving stems.

³ Average of five tallest trees in each inner plot.

Seed for the shortleaf pine plantation in New Jersey came from one New Jersey source and six more southern sources (table 2). Seedlings

were grown at the New Jersey State Nursery at Washington Crossing. They were planted as 2-0 stock on a former nursery site in the Green Bank State Forest, Burlington County, N.J.

In both plantations, stock from each source was planted in four 0.1-acre plots. Spacing was 6 by 6

feet.

TABLE 2.--Height and survival of shortleaf pine seedlings in a New Jersey plantation, by geographic source

| Source | Height | | Survival 5 years after planting |
|--------------------------------|---------------------------|--------------------------------------|---------------------------------|
| | When planted ¹ | After 5 growing seasons ² | |
| | <u>Inches</u> | <u>Feet</u> | <u>Percent</u> |
| Burlington County, N.J. . . | 9.6 | 6.8 | 94 |
| Anderson County, Tenn. . . . | 11.2 | 5.4 | 70 |
| Dent County, Mo. | 12.2 | 5.2 | 72 |
| Southampton County, Va. . . . | 11.7 | 4.7 | 53 |
| Union County, S.C. | 12.5 | 4.2 | 36 |
| St. Helena Parish, La. | 14.4 | 4.0 | 23 |
| Webster County, Ga. | 14.9 | 3.4 | 41 |

¹ Average height of living portions of stems. Portions killed by winter injury are not included.

² Average height of surviving seedlings.

Results

As noted in an earlier report on this study (1), seed from southern loblolly pine sources usually produced seedlings that were taller when planted than seedlings from local sources. But these taller seedlings were in poor condition--their foliage had suffered much winter injury and they lacked growing root tips characteristic of seedlings from local sources.

After planting, the southern stocks continued to suffer far more winter injury and wet-snow damage than local stocks. Wet-snow damage was especially severe in 1957-58.

After 10 years, the local stock was much taller. Its average height was 2.0 feet more than the next best source and 8.5 feet more than the poorest source (table 1). Its average diameter exceeded that of other sources by

0.1 to 1.1 inch. Survival of seven of the nine loblolly sources was 80 percent or greater.

The five tallest trees in each inner plot (equivalent to 123 trees per acre) would be potential crop trees if they were managed for timber in an ordinary plantation. The average height of these five dominants differed by source about as much as the average height of all the trees in the inner plots differed. For the local source, the average 10-year height of the five dominants was 31.6 feet. The average height of the shortest dominants, those from Livingston Parish, La., was only 24.2 feet. These differences are expected to increase with time. If growth follows usual site-index curves, this would mean a difference in height of dominants of 20 to 25 feet at 50 years.

As noted in the earlier report (1), shortleaf pine plantings made in 1953 failed. Results given here are for a second (1958) planting (fig. 1). Based on the inner 49 trees per lot, more seedlings from a local source survived, and they grew much taller than seedlings from more southern sources (table 2). Survival of the local stock was 94 percent, nearly one third better than that of the next best source. Height of the local stock, 6.8 feet, is 2.1 feet greater than that of the source closest geographically, that from Southampton County, Va. This height is more than twice that of the Webster County, Ga., source.

For both the loblolly pine and the shortleaf pine, only the local stocks have many straight, vigorous, healthy-looking stems. For example, on the non-native loblolly pines, fusiform rust has produced many stem cankers. And even in closed stands, much of the foliage of the nonnative trees has been killed during the winters.

These results are similar to those obtained in most other seed-source tests; they again show the great importance of using local seed. Loblolly and shortleaf pine seed from areas south of Maryland may be less expensive, but such seed will almost surely yield poorly adapted stock in New Jersey or Maryland. Therefore,



Figure 1.--Shortleaf pines 6 years after planting in New Jersey. Trees behind the man are from New Jersey, and those in front of him are from Louisiana. Note the greater growth and survival of the local stock.

planters should not waste time and effort on such stock.

Literature Cited

(1) Little, S., and Tepper, H. B.

1959. Six-year results from a Maryland planting of loblolly pines from different seed sources. Northeast. Forest Tree Improvement Conf. Proc. 6: 26-29.