

4. SET-BACKS AND ADVANCES IN THE SOUTHWIDE PINE SEED SOURCE STUDY

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The Southwide Pine Seed Source Study probably is familiar to most of you from a number of published notes concerning it, and certainly needs no introduction to those of you cooperating in its execution. It is for these reasons, as well as to conserve the time of the Conference, that the Program Committee has asked me to report mainly on the gains and losses experienced in bringing the study through its first three years. These gains and losses can as yet be evaluated only in rather general terms, but can, I hope, be made more vivid to you by means of a few slides.

At least four other provenance tests of southern pine seed were begun before the present Southwide Pine Seed Source Study was launched in 1951. The present study, however, was the first specifically designed to permit mapping, for loblolly, slash, longleaf, and shortleaf pines, the zones within which seed may be moved freely from collecting ground to planting site, but across the boundaries of which seed probably or definitely should not be moved.

The present study is a tremendous undertaking. It has involved collection of seed from 50 geographically distinct sources, and production and shipment of 1,824 lots of stock from 19 different nurseries and their establishment in 66 separate plantations in 16 different States. Planting, by the end of the current season will total, in round numbers, 220,000 trees. All seed collection, stock production, and planting has been carried out by volunteer cooperators--several hundred of them in dozens of different organizations. Coordination of the work has been effected entirely by mail and an occasional telegram or long-distance telephone call. In an enterprise as vast and farflung as this, some set-backs have been unavoidable. What these setbacks have been, and to what extent they may have jeopardized the purpose of the study, is the main subject of this paper.

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1. Shortage of 1951 seed in some localities, and failure to find cooperators in others, led to a few omissions of desirable sources from the study, and an occasional less-than-optimum grouping of sources in test plantations. In addition, a very few seed lots were collected in an off-standard manner. The Subcommittee on Geographic Source of Seed feel that these set-backs are minor and have not materially weakened the study.

2. Other shortages in 1951 and 1952 necessitated planting one of three longleaf pine "series" a year later than the other two. They also necessitated planting adjacent plots in the one slash pine series and in two longleaf series in two successive years instead of simultaneously. This mixing of age classes has complicated establishment records and re-examination schedules. It has robbed initial survival of part of its value for distinguishing geographic races, and it may reduce the value of some pathological data. It is thought, however, that the mixed age classes will have unimportant effects upon growth to pulpwood size and beyond.

3. In 1952, about a third of the cooperating nurseries produced insufficient stock from one or several seed lots. Practically all shortages were made good from surpluses at other nurseries, but at the cost of further complicating establishment records and further decreasing the value of initial survival as a measure of racial variation. As in the case of mixed age classes, however, the harmful effects on the more important long-time phases of the study should be relatively unimportant.

4. One of the most feared sources of trouble--departure from prescribed design in planting--proved least important. Of the 1,528 plots put in in 1952-53, 94 percent were perfectly installed, and an additional 4 percent well enough installed to meet the needs of the study. So far as is known, all 260 plots planted in 1953-54 were perfectly installed, and the 36 plots remaining to be planted should cause little or no trouble. Of the 1,788 bundles of 121 trees each that have been lifted and shipped to date, only 1 has been lost in the shuffle--truly a remarkable record.

5. Mortality--especially from drought--in 1952 and 1953 has set the study back more seriously than all other mishaps combined. Up-to-the-minute details are unavailable, because only part of the plantations have been scheduled for reexamination this winter, and the scheduled re-examinations are not yet complete. From all available information, however, the current state of the study appears to be as follows:

Of the total of 66 plantations, 9 apparently have suffered such heavy mortality as to be valueless or nearly so, and an additional 25, while still capable of yielding useful information, may be less subject to precise evaluation than had been hoped. The remaining 32 plantations should permit rigorous, sensitive statistical analysis as originally planned.

The worst losses have occurred in the western-most part of the territory covered by the study, and in the Carolinas, and shortleaf and longleaf pine plantations have suffered most severely. As a result, there is some question whether seed-collecting zones for these two species can be mapped satisfactorily without the establishment of additional plantations. The feasibility of such additional planting of longleaf and shortleaf has not yet been fully explored.

This is the debit side of the ledger.

On the credit side, useful mapping of loblolly and slash pine seed-collecting zones seems assured from plantations already in the ground. In addition, the longleaf and shortleaf plantations which have survived initial establishment constitute a reservoir of information not to be ignored. Any one such plantation, because of superior design and better choice of seed source, is potentially more valuable than the original loblolly seed source plantation established at Bogalusa with seed from the 1925 crop, which will be reported upon by Bercauw later this morning. Any pair of such plantations of the same species and series is far more valuable than the original one at Bogalusa because it measures the interaction between an array of genetically different stocks and two distinctly different geographic settings. The inroads of drought, therefore, have by no means robbed the longleaf and shortleaf components of the study of all usefulness, even though they have rendered them inferior to the loblolly and slash pine portions of the study.

Also on the credit side must be recorded the rapidly accumulating evidence that the geographic sources under investigation do, in many instances, represent different races of the four principal southern pines. Differences in growth rate, in foliage habit, in root habit, and in reaction to day length and to low temperature appeared in the nursery during the first year. The first and second years in the field have brought out some differences in survival which can be attributed only to racial variation, and numerous racial differences in growth rate, cold resistance, and resistance to heat and drought. In loblolly pine differential infection by fusiform rust, to be reported in more detail by Henry, has confirmed, and may have usefully extended, the findings in earlier studies of rust infection in this species. Considerable time must still elapse before the pattern of these various differences is clear enough for economic application. Nevertheless it is decidedly

encouraging to have so much of the pattern show within three years of the collection of the first seed used in the study.