# TECHNOLOGY TRANSFER PLAN - LONGLEAF PINE MANAGEMENT

A. G. Kaisl

ABSTRACT. The U.S. Forest Service, in cooperation with many knowledgeable individuals has formulated a Technology Transfer Plan for Longleaf Pine Management. The message to be transferred is Techology is now available that allows longleaf pine to survive well on many sites, grow out of the seedling stage quickly, and produce high yields of quality products. Technological advances in nursery operation, artificial reforestation, natural regeneration, and site management will be transferred to the pertinent user-groups. The objective of the plan is to reverse the negative trend of longleaf pine acreage by the year 1995. The effectiveness of the program will he evaluated by the total number of nursery-grown seedlings and by the total longleaf pine acreage. All members of the Southern Forestry community are targeted for the technology transfer by a combination of all possible media approaches.

---

A. G. Kais is Principal Plant Pathologist at the Southern Forest Experiment Station, USDA Forest Service, Gulfport, Mississippi.

Longleaf pine, a major component of the Southern plains coastal forest, now grows on only 4 million of the 60 million acres it once occupied in eight different States (Table 1). During the past 50 years, longleaf land was primarily reforested with loblolly and slash pine because longleaf pine was difficult to regenerate. Recent research has provided technology that successfully overcomes the poor survival and slow early growth of longleaf pine that inhibited regeneration. Consequently, planting longleaf pine, especially on sites favoring its growth, now appears to be a viable and commercially positive alternative for land managers.

The Southern Station and Region 8 of the U.S. Forest Service have formulated a Technology Transfer Plan for Longleaf Pine Management. Experts from Federal and State Agencies, Universities, and private Industry have all contributed to its formulation and will cooperate in implementing the plan. The major message to he transmitted is Technology is now available that allows longleaf pine to survive well on many sites, grow out of the grass stage quickly, and produce high yields of qualit[y] products.

There are four major components of the plan: (1) Nursery operation, (2) Artificial reforestation, (3) Natural regeneration, and (4) Site management. The significant advances made in each of these components will be disseminated to their specific user-groups. The nursery operation component is concerned with the growth, packing, storage, and transport of the seedlings to the grower. Artificial reforestation is concerned with all phases of the planting, survival, and initial growth of bare-root and container grown longleaf pine seedlings from forest nurseries. Natural regeneration is

concerned with specific techniques such as the Shelterwood System for in-place reproduction within existing stands of longleaf pine. Finally, the site management component is concerned with the methodology to promote growth and improved product quality within established longleaf pine plantations.

The objective of the Plan is to reverse the negative trend in longleaf pine acreage by 1990, and to obtain a net increase by the year 1995 over the 1990 acreage. Technology is usually considered to be successfully transferred when it has been adopted and put into practice by the target user-groups. Consequently, success of the Plan will be evaluated by subse[q]uent changes in two measurable areas: (1) the total number of longleaf nine seedlings grown in tree nurseries, and (2) the total number of acres in the longleaf pine forest type.

This technology will be transferred to most segments of the Southern forestry community. This will include people in Alabama, Louisiana, Florida, Mississippi, North Carolina, South Carolin, and Texas. Specifically targeted groups include: (1) bare-root and containerized tree nursery managers, (2) foresters, both privately and publicly-employed, and (3) nonforesters, such as landowners, vendors, contractors, and agricultural professionals.

Various approaches will be used to transfer the technology to the various target groups. Media to be used by the transfer team include: (1) workshops, (2) symposia, (3) organized and self-guided tours, (4) slide-sets with accompanying manuscripts, (5) newsletters, (6) popular and technical articles, (7) canned lesson plans, and (8) training sessions.

This Plan resulted from the input of many knowledgeable people working and intimately familiar with the longleaf nine problem. As the effort unfolds and progresses during the next 5 years, more experts will he recruited as needed to insure success of the endeavor.

The Nursery operation component of the Plan is probably the most important one for the overall success of the Technology Transfer Plan. Undoubtedly, increased production of high-quality seedlings in the nursery will translate into increased longleaf acreage in the field. Nurseries that utilize proven technological advances such as low seedbed densities, root and top pruning, inoculation with Pt ectomycorrhizae, and utilization of the henomyl treatment, will produce high-quality seedlings that will survive well and grow rapidly after outplanting in the field. Seedling quality is probably the most important factor for the successful establishment of longleaf pine plantations.



The Forest Service has recently established (April 1986) a Longleaf Pine Nursery Seedling and Field Demonstration at the Ashe Nursery at Brooklyn, Mississippi. The objective of this operation is to illustrate the effects of selected biological and cultural practices for the production of high-quality, bare-root longleaf pine nursery seedlings with improved capabilities for field survival and early height growth. This demonstration will be used to highlight a longleaf pine nursery cultural management workshop that will be held in Fall or Winter of 1987-88 in Southern Mississippi. This workshop will be designed specifically for the needs and concerns of nursery specialists. Hopefully all Southern forest tree nurseries will send representatives to the workshop.

Table 1.--Decrease of longleaf pine acreage over time in the Southern States[1]

| State | Year | | | |
|---|---|---|---|---|
| | 1955 | 1965 | 1975 | 1985 |
| | 1000 acres | | | |
| Alabama | 1504 | 989 | 735 | 714 |
| Florida | 4390 | 2299 | 1372 | 1114 |
| Georgia | 2486 | 1362 | 778 | 632 |
| Louisiana | 1412 | 684 | 403 | 303 |
| Mississippi | 1179 | 663 | 416 | 319 |
| North Carolina | 654 | 524 | 454 | 382 |
| South Carolina | 819 | 571 | 482 | 446 |
| Texas | 223 | 132 | 47 | 29 |
| Totals | 12667 | 7224 | 4687 | 3939 |

[1]Source: Interpolated forest survey data from the SEFES and the SOFES.

SELECTED REFERENCES

Farrar, R. M., and J. B. White. 1982. Early development of longleaf pine planted on prepared sites in the east gulf. Proc. South. Silvic. Res. Conf., Nov. 4-5, 1982, Atlanta: 109-117.

Hatchell, G. E. 1984. Seedling quality and field performance of longleaf pine seedlings affected by ectomycorrhizae and nursery cultural practices. Proc. South. Silvic. Res. Conf., Nov. 7-8, 1984, Atlanta: 395-402.

Kais, A. G. 1985. Recent advances in control of brown spot in longleaf pine. Proc. 34th Annu. For. Symp., March 26-27, 1985, La. State Univ.: 83-90.

Kais, A. G., and M. M. Griggs. 1984. Control of brown-spot needle blight infection on longleaf pine through benomyl treatment and breeding. Proc. IUFRO Working Party Conference on Recent Reserch on Conifer Needle Diseases, Oct. 14-18, 1984, Gulfport, Miss.: 15-19.

Kais, A. G., G., A. Snow, and D. H. Marx. 1981. The effects of benomyl and Pisolithus tinctorius ectomycorrhizae on survival and growth of longleaf pine seedlings. Sou. J. App. For. 5(4): 189-195.

Kais, A. G., C. E. Cordell, and C. E. Affeltranger. 1986. Nursery application of benomyl fungicide for field control of brown-spot needle blight (Scirrhia aciclola (Dearn.) Siggers) on longleaf pine (Pinus palustris Mill.). Tree Planters' Notes 37(1): 5.

Mann, W. F., Jr. 1969. At last--longleaf pine can he planted successfully. For. Farmer 28: 6-7, 18-19.

Nelson, L. R., B. R. Zutter, and D. H. Gierstad. 1985. Planted longleaf pine seedlings respond to herbaceous weed control using herbicides. Sou. J. App. For. 9(4): 236-240.

White, J. B. 1981. The influence of seedling size and length of storage on longleaf pine survival. Tree Planters' Notes 32(4): 3-4.