OVERVIEW OF SOUTHERN REGENERATION

Clark W. Lantzl

ABSTRACT.--Nursery production in the South has increased significantly in the last 30 years due to a greater concern for regeneration by state, federal, and industrial forestry organizations. The Conservation Resource Program has resulted in the largest planting program in the South since the Soil Bank. We have planted trees on over 1 million CRP acres in the South, which amounts to about 93% of the program nationwide.

During the 1987-88 planting season from 85 to 90% of the 2 billion seedlings grown in the South were from genetically improved sources. Seedling quality, seedling care and handling, and plantation survival are topics of renewed concern.

PLANTING IN THE SOUTH

Forest planting in the South has increased from 33,000 acres in 1925 to over 2 million acres in 1987. During this time significant gains in planted acreage have largely been due to the Civilian Conservation Corps (CCC) from 1935-1942, the Soil Bank Program from 1956-61, and increased emphasis on regeneration by forest industries and the state forestry organizations in the last 10 years (Table 1). The Conservation Reserve Program has initiated the largest planting program in the South since the Soil Bank. Over 1 million acres have been planted in the South under the CRP, which amounts to about 93% of the national program.

[1] Nursery/Tree Improvement Specialist, Southern Region, USDA Forest Service, Atlanta, GA.

Table 1.--Planting and Seeding in the South

Year	Public Land	1925-87 (Industrial Land	acres) Non-Ind. Private	Total
1925	2	17	14	33
1930	1	7	5	13
1935	20	2	23	46
1940	60	8	110	179
1945	2	8	47	56
1950	44	131	119	294
1955	35	239	228	502
1960	69	497	1,015	1,581
1965	92	406	230	728
1970	93	606	178	877
1975	117	904	250	1,272
1980	114	981	395	1,490
1985	102	1,179	719	2,000
1987	118	1,200	865	2,182

FOREST TREE NURSERIES IN THE SOUTH

In response to the increased demand for seedlings, the number of forest tree nurseries in the South has doubled in the last 30 years, from 48 in 1956 to 96 in 1986 (Table 2). The largest increase in the number of nurseries has been in the industrial nurseries which increased from 15 in 1956 to 37 in 1986.

Corporate mergers, leveraged buyouts, and consolidations have occurred rapidly among the southern forest industries in the last few years. These have often resulted in organizational name changes, reorganizations, and some major restructuring. As a result, some southern nurseries have changed hands, some have changed names, and a few have changed owners.

A landmark event occurred in 1986 when Weyerhaeuser opened their 406 acre Quail Ridge Nursery near Aiken, South Carolina. This nursery is the largest industrial nursery in the world with a current crop of over 100 million

seedlings. The nursery is designed to operate with the center - pivot irrigation system. Seedbeds were designed on the contour to be compatible with the irrigation system.

A number of private nurseries have been started in the last few years, primarily as a response to the CRP. The 22 nurseries in this category include some nurseries which were purchased by private individuals from forest industry and some which were started from bare soil. In 1987 these private nurseries produced over 100 million seedlings.

Table 2.--Number of Forest Tree Nurseries in the South: 1956-86.

	1956	1966	1976	1986
Federal	5	2	2	1
Forest Industry	15	13	28	37
State	28	36	36	36
Private	--	--	--	22
Total	48	51	66	96

STATE NURSERY PROGRAMS

The largest increase in the number of state nurseries occurred during the Soil Bank period when the number of southern state nurseries increased from 28 to 36. Since that time very few new state nurseries have been built and only a few have been closed. In looking back over the records for 1956 it was interesting to note that TVA had three nurseries in operation: Muscle Shoals, Alabama and Clinton and Norris, Tennessee. All three of these nurseries were closed down after the Soil Bank. Some familiar names were noted among the nursery managers in 1956: Alabama - N. D. Pearce, Carl Muller, Ed Hyde, Walt Chapman; Florida - W. T. Green; Kentucky - Jack Rhody; Louisiana -

Charlie Peevy, Gene Turner; Mississippi - E. C. Jones; North Carolina - Dwight Brenneman, Bill Bland; Oklahoma - Bill Campbell; South Carolina - Larry Staley; Tennessee - Gerald Williams; Virginia - Bill King. All southern nurseries produced about 591 million seedlings in 1956 - about one-fourth of the number produced last year.

Most of the southern state forestry organizations have increased nursery production in response to the CRP. New state nurseries have been built in Georgia and Virginia. Nursery expansions have been completed in Alabama, Florida, Mississippi, North Carolina, South Carolina and Texas. The Garland Gray Nursery in Courtland, Virginia is a modern, state-of-the-art facility which incorporates many of the best features of other nurseries throughout the South. This nursery was urgently needed to "spread out" nursery production of the Virginia Department of Forestry. The result will be higher seedling quality at all three VDF nurseries.

The Georgia Forestry Commission established a new record for nursery construction when the Flint River Nursery was built in 1987. The 832 acre tract was purchased from January to April 1987. The first 80 acres were developed, irrigation system installed, and sowing completed by May 8, 1987. During the 1987-88 lifting season a total of 48 million seedlings were lifted, packed and shipped at this nursery. The 1988-89 crop is predicted to be 70 million seedlings. Plans call for a 832 acre nursery and seed orchard complex with a goal of 80 million seedlings produced annually with 250 acres of seed orchards and 75 acres of progeny tests, clone banks and other research projects.

In the 1987-88 season the Georgia Forestry Commission produced, lifted and shipped 173 million seedlings from five separate nurseries! This amounted to about 24% of the total production of the southern state nurseries.

PRODUCTION OF GENETICALLY IMPROVED SEEDLINGS

Currently all of the southern state forestry organizations except Kentucky and Tennessee are members of one or more of the southern tree improvement cooperatives. Most of the cooperative members have been producing commercial quantities of improved seed since the 1970s. The southern state nurseries produced 462 million seedlings in 1976, of which about 14% were genetically improved. In 1986 these nurseries produced 585 million seedlings, with 84% of these genetically improved. (table 3).

Table 3.--Nursery Production
South
1956-86

	(Million S	1956	1966	1976	1986
Federal:	Total number of seedlings	99	28	21	29
	Number genetically improved			7	25
	Percent improved			33	86
Industry:	Total number of seedlings	65	111	395	1,015
	Number genetically improved			163	964*
	Percent improved			41	95*
State:	Totoal number of seedlings	427.	380	462	585
	Number genetically improved			63	491
	Percent improved			14	84
Total:	Total number of seedlings	591	519	878	1,629
	Number genetically improved			233	1,480
	Percent improved			27	91

(*Industry data estimated)

The percentage of improved seedlings from state nurseries ranged from 25 to 100 in 1987, with three states (AL, GA, LA) producing all improved seedlings.

In 1986-87 Ashe nursery produced 29 million seedlings of which 25 million were improved. The only woods-run seed used was longleaf which is not yet in full production in the seed orchards.

Most of the southern forest industries are also members of one or more of the tree improvement cooperatives. For all but the minor species these industrial nurseries have been producing only improved seedlings for several years.

Southwide it is estimated that more than 90% of the seedlings currently growing in our nurseries are genetically improved. Our goal has been to grow only genetically improved seedlings by 1990. With the exception of longleaf, it appears that we will reach our goal!

PRIORITIES FOR THE FUTURE

Southern pine seedlings must be of the highest possible quality and they must be tough. They must be tough to survive the many hazards that confront them from lifting through packing, shipping, storage and planting. Tough seedlings have heavy (fibrous) root system and large root collar diameters. These seedlings have consistently performed better than smaller and weaker seedlings (South and Mexal, 1984; Blair and Cech 1974). We have both the knowledge and the technology to grow these tough, high quality seedlings. What is needed in most organizations is a high-level decision to utilize this knowledge and employ these techniques to grow the tough high-quality seedlings that are needed. These seedlings will cost more to grow than run-of-the-mill seedlings but there is no better investment that can be made for the future productivity of our forests.

Most of our southern nurseries have many customers. Some of these people are experienced in handling seedlings - others have no idea of the proper way to care for seedlings. In our reviews of the Conservation Reserve Program we have seen all degrees of seedling handling - from the very best to severe abuse. In fiscal year 1989 we will start a Technology Transfer Plan entitled:

Improved Techniques for the Care and Handling of Southern Pine Seedlings. This project will be a grass-roots campaign designed to convince service foresters, regeneration foresters, landowners, nursery workers and planters of the importance of careful handling of seedlings. We will use different media, e.g. posters, slides, and video tape to package this information so that it will be easily understood by our many different customers. We will be calling on several nursery managers for help and we welcome suggestions from all interested people.

REFERENCES

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