

THE ROLE OF THE FOREST TREE NURSERY TODAY^{1/}

R. G. Hitt, U. S. Forest Service, Washington, D. C.

Throughout the length and breadth of the South today, there is a dynamism of growth and change taking place in the forest industry that is almost unbelievable. Before the advent of automation, computerization, Soil Bank Plantings, industrial expansion, etc., seedling production and tree planting showed slow and easy growth rates. The 139 thousand acres planted nationally in 1930 seemed large, yet by 1950 nearly one-half million acres were planted annually.

This upward trend continued so that in 1956, well over 900,000 acres were planted in the United States. Then came the Soil Bank Era during which thousands of additional acres were planted. In 1959 and 1960, a nation-wide tree planting effort resulted in over 2 million acres planted each year. Although the Soil Bank Program was curtailed, the tree planting efforts of many landowners had become traditional and their endeavors kept the acreage planted nationally during the 1960's well over 1 million acres annually.

Forestry in the Southern and Southeastern States during this period grew in all aspects. In 1967, over one-half of the 1.4 million acres planted nationally were in our 13-State Southeastern Area. That's over 786 thousand acres in all types of ownerships. Since our concern here today relates primarily to tree nurseries and tree planting stock, let's look together at some of the vital statistics of this part of the expanding forestry enterprise.

In your 13-State Southeastern Area, there are 54 private, State and Federal nurseries producing tree planting stock. Their combined production of tree planting stock in 1967 was well over 621 million trees. This was 64 percent of the nation's total production.

Of interest, too, is the fine job done by the industrial forest nurseries. In the Southeastern Area in 1967, these industrial nurseries turned out over 91 percent of planting stock produced nationally by forest industry owned and operated nurseries.

It is conservatively estimated that the market value of all of this forest tree planting stock at the time of sale in 1967 easily exceeded 3 million dollars. What its ultimate value will be when completely harvested around the year 2000 is anybody's guess. Mine is that it will exceed 130 million dollars. Its value in finished products delivered to final consumers will be in excess of 12 billion dollars. Gentlemen, you're part of a big stakes game.

1/ LeRoy Jones, U. S. Forest Service, SA, S&PF, Atlanta, Ga. presented this speech for R. G. Hitt at Stone Mountain, Ga. Hitt presented it at Alexandria, La.

Slash, loblolly, shortleaf, and longleaf pines are among the top 10 coniferous species produced by our nation's forest nurseries, with slash and loblolly pines leading the list. Their combined production exceeds the 300 million mark. Southeastern Area forest nurseries, your nurseries, are the leaders again.

Another dynamic area of activity on the forestry scene here in the South is that involving forest genetics and tree breeding. Nowhere else in the nation is the work in progress on tree breeding as great as it is here in Dixie Land! A number of key factors have conditioned this progress. They include the existence of a rich forest resource from which breeding stock could be selected; a favorable and longer growing season; an expanding forest industry that recognized the need for a continuing and increased raw wood resource base; and private, State, and Federal organizations that early began to devote time, money, and personnel to this important work.

The wisdom of these early decisions to "go for bust" in the tree breeding business and the gains hopefully expected are no longer in question. Our need to argue by analogy with gains made in other agricultural crop and animal breeding work exists no longer. Average yields of over two cords per acre per year, and over two tons of dry wood matter per acre per year from open-pollinated progeny test plantations are reported by the North Carolina State Industry Cooperative Tree Improvement Program. These figures are at 7.5 years of age which is really the age at which such stands are just beginning significant volume growth.

Some of you may still wonder somewhat about all this activity and its relationship to your roles as forest tree nursery managers. Most of you know full well already its significance to you. As the logical "on-the-spot" manager, many of you are now involved as cooperators in seed orchard operations. Perhaps some of you have this entire responsibility for some or all of your organization's orchards. Others of you are now growing seedlings derived from seed orchard seed either for your own organization and/or on contractual arrangements for others. Regardless of the activity, all of you are in the tree breeding business at some level and all of you must be prepared to accept even greater roles in this effort in the years immediately ahead.

The annual production of seedlings from seed orchard seed now well exceeds the 50 million mark. That's approaching 10 percent of our annual southern production. Within 10 years, every nursery of significance in the South will be producing stock derived from seed orchard seed.

Gentlemen, a new era in southern forest nursery management has dawned.

Before we plunge into prognostication about this new era, let's cover briefly another new and rapidly expanding area of activity on the southern forestry scene. Its spread across the South, combined with its demand for a continuing wood resource base, make it significant to all forest land management planning. I refer here, of course, to the new southern plywood industry. The growth of the plywood industry in the South is almost unbelievable. In 1964, a few southern plywood plants produced about 80 million square feet of plywood. By the end of 1965, 12 southern plywood plants produced over 400 million square feet and by January 1, 1967, 23 mills were in operation and had turned out over 1 billion square feet of southern pine plywood. Thus, from 3 plants in 1964, 34 plants are expected to be producing by late 1968. So, another of the wood using industries has moved into the Southlands with every expectation for continued growth and profitability based on a continually renewing wood resource. Intensive forest land management practices including plantation establishment are key factors in this wood resource production picture. A continuous supply of high quality planting stock will be needed for many, many years.

Guttenberg and Fasick (1968) in a recent article in the Forest Products Journal listed a number of factors which contributed to the rapid growth of the plywood industry in the South. Their analysis suggests that as this industry continues to expand, it will have to adapt to progressively more typical timber-supply situations. They stated that among other things, timber for both the lumber and plywood industries will have to be obtained from a multiplicity of small ownerships.

Currently, there are over 15 million acres of forest plantations here in the South. Many of these are on the holdings of small woodland owners. To bring these lands under good forest management presents another problem and challenge for the professional forester of the South. This management will include expanded planting practices aimed at getting onto the land improved quality stock. We expect and need to grow 50 percent more wood on our present forest acreage. With a continuously diminishing land base available for forestry, we'll have to produce present volumes on about one-third less acreage. We need say no more then about the urgency for putting our forest lands, large and small ownerships alike, under sound forest management practices which include reforestation efforts that utilize the highest genetic quality improved planting stock available. Now, let's look at tomorrow.

As forest nursery managers, you can expect present levels of nursery production to continue and even expand. In most areas here in the South, time is an important factor in forest land management. Although many tools are available to the reforestation forester, including planting, direct-seeding by both ground seeders and aerial

applications, tubling culture and even natural regeneration, in the majority of cases the man and/or machine with a healthy, good quality tree seedling will predominate.

Attending this continued high rate of planting stock production will be an increased activity in the area of contractual growing of seedlings. The forest industry, in general, recognizes the increased competency of the State nurseries to produce quality planting stock. This combined with increased costs of production for the smaller nurseries has favored the decision by many companies to close down their own nurseries and go to contractual arrangements with State agencies for custom growing of planting stock. This, of course, means that as nursery operators, each of you has an added responsibility to keep up-to-date in your efforts to produce only the highest quality, lowest cost planting stock.

Your nursery management practices must continually improve. Seed sizing, prescription fertilizing, the possible use of systemics, maximum uniformity in stock size through the use of growth regulators, strict bed densities, closer adherence to seed testing data recommendations, etc., are all important and will affect your ability to meet the demands and challenges of the new era.

You can expect automation to become a way of life in your nursery management. Included will be everything from order print-outs to shipping labels and accurate inventory accounting. Soil, weather, and seedling growth data can be programmed to provide prescription watering, spraying, and fertilizing schedules. Developmental work currently underway will make available soon automated equipment for lifting seedling stock. You'll hear more about this later here at your conference.

"It can't be done" were yesterday's words. "How soon?" are today's and "What's next?" are tomorrow's. Actually, as far as most nursery operations are concerned, we're operating 50 years behind the times equipment-wise. The critical labor situation in most nurseries will force the innovators into action. Witness what has happened over the years in most of your own nurseries. You couldn't buy what you wanted or needed, so you fabricated one. I'm thinking here, for example, of your various packaging operations. Here is an area, too, where automation will do the entire job of lifting and packaging for you right out on the nursery beds.

Tubling production will increase in most southern forest nurseries as forest land managers seek to extend their planting season through the use of this type of stock.

As stated earlier, seedling production in most southern forest nurseries within the next 10 years will be derived largely from seed

orchard seed. Already there are over 5,500 acres of seed orchards in our 13 Southeastern Area States and this acreage is increasing. Incidentally, over 87 percent of all forest tree seed orchard acreage in the United States is here in the South.

Experience has shown that, in general, approximately one plantable seedling results from each two seeds planted in our southern nurseries. Gentlemen, with your increased know-how and with the array of technical procedures available to you, this can be improved. Therein lies a real challenge for each of you. Forget your fudge-factors, nurseryman's extra pinches, etc., and attack this problem with an honest cost-benefit frame of mine. Although seed orchard seed isn't cheap, its cost will diminish as volume production increases and as you get that "seedling for seed" ratio closer to 1:1.

While we're talking about seed, our researchers have shown that clonal differences do exist with regard to flowering response to fertilizers applied in seed orchards.

Further, they've shown that fusiform rust resistance is heritable and prohibition of diseased trees in your seed orchards does pay off in the amount and quality of seed derived from the orchards. As Tony Squillace (1967) and others have stated, we can't and shouldn't expect to produce the perfect tree in one generation, but we can produce improved quality stock for one, two, and perhaps even more characteristics. Disease and insect resistance are such characteristics. This type of improved parental stock will soon enter your seed orchards.

As the opportunity and need for second generation seed orchards increases, I suspect the industry will turn more strongly to public agencies to fulfill this need. This can be expected on the basis of an attitude of cooperation that prevails and is ever widening among all agencies and organizations currently engaged in tree breeding and forest genetics work here in the South.

In addition, State Forester organizations are developing the technical competence needed to carry out these programs. Also, increased public funds are flowing into tree improvement work.

The overall gains derived from the first generation orchards will in the long run pay their way. Material of superior quality, as indicated by progeny testing, will base the second generation orchards. Increased costs for all phases of orchard establishment and management combined with attending increased land costs suggest the realistic cost-basis for public fund development of these second and subsequent generation forest tree seed orchards. True, there will always be a place for private enterprise in this endeavor, especially when one considers the foreign seed market demands for several of our southern pine species. Domestic needs, however, probably will present a different problem.

Most forest nursery managers can expect to increase their production of hardwood species. In the pulp and paper industry, 30 to 50 percent utilization of hardwood species is not uncommon today. Granted, we have some mills using none, while others are 100 percent hardwoods. We must also remember when considering this increased hardwood production potential, that not all hardwood species can be or ought to be considered economically adapted to regeneration by planting. Whatever the circumstance, these former "renegades of the ridges" and "weeds in the woods" species currently play a significant and increasingly more important role in the forest management picture here in the South.

Studies on species-site interrelationships for both pine and hardwoods are needed. Good quality stock is a prime requisite for such studies. And, each one of you can play an important role by producing this quality stock as needed.

So, what is the role of the forest tree nursery today? Why it's bigger than it's ever been!

--You'll soon be producing the finest genetic quality planting stock of both coniferous and hardwood species ever to leave a southern nursery.

--You'll have stock available that is tailored for specific reforestation needs.

--Quality will be your hallmark.

--Expect your total production to increase. For some this will be a significant increase. As forest land management is refined, the right tree in the right spot, right now will prevail. You'll produce that stock.

--Expect automated, computerized operations to become routine with you.

As these predictions become reality, each of you will make additional positive and significant contributions to the continued growth of the dynamic forest industry here in the great 13-State Southeastern Area.

LITERATURE CITED

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