

NOW WE'RE GETTING SOMEWHERE

By

Thomas C. Nelson 1/

Good morning. Again welcome to the 11th Southern Forest Tree Improvement Conference. May I compliment you on the theme of this conference---it is most appropriate: NOW WE'RE GETTING SOMEWHERE! I can't hear that expression without thinking of the old farmer in Kansas who, after much soul-searching, spent \$5,000 on a tornado shelter. After several years of no tornadoes, he was beginning to wonder if he had spent his money wisely. But one day the tornado warnings came and he placed himself and his family down in the shelter. After two hours, he climbed the steps, peeked out and beheld one of the worst scenes of destruction ever witnessed by man ---there was no barn, cattle were strewn throughout the countryside, his house was a shambles and most of his trees were uprooted.

"Well," he said, "now we're getting somewhere:"

Thankfully, we have a different reason for making that statement. Our long years of struggle with tree improvement are really beginning to pay off. In fact, it seems that dramatic results are piling up almost suddenly. It probably appears so to the outsider anyhow, but we know only too well that success has come to the tree improvement specialist like it did to Johnny Carson. He says it took 20 years for him to become an overnight sensation.

I have attended several of your tree improvement conferences in the the past but, now that you are overnight sensations, it is a particular pleasure to attend your eleventh meeting. I can remember, as I know you can, when tree improvement research was a modest undertaking, with only a few people climbing trees with little bags and stirring the curiosity of the entire countryside. In those days, their primary job was to select superior tree candidates and to make a few controlled pollinations to learn something about the heritability of tree characteristics. Fifteen years later, Keith Dorman's 1966 summary of Forest Tree Improvement Research in the South and Southeast listed 36 agencies and 305 projects not to mention the great number of people engaged in seed orchard development and tree evaluation work. Seed orchard development began about the same time as tree improvement research and, today, the production of improve seedlings is a reality. Many of them are from proven superior parents.

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Think of it! The progeny of more than 10 clones in the South now show extreme resistance to fusiform rust, and the availability of rust-resistant seed from specialty orchards is just around the corner. Seven of these clones were proved out on the North Carolina State University cooperative project, involving Union Camp Corporation, U. S. Plywood-Champion Papers, Inc. and Continental Can Company. The economic impact of this development alone to forest operations in areas of high rust infection is astronomical.

Breakthroughs are occurring on many other fronts as well. We expect seed from high-gum-yield seed orchards to be available for planting within three or four years. Trees from this seed are expected to yield 25 to 100 percent more gum than ordinary trees.

Cottonwoods have been known as "instant trees" because of their superior growth characteristics; but now 14 superior clones have been developed by the Southern Hardwoods Laboratory at Stoneville, and we have run out of adjectives to describe the improved growth possibilities. Through the efforts of the Southeastern Area, State and Private Forestry, 600,000 cuttings will be made from these clones within the next year to meet the planting needs of industry and State nurseries for the production of superior planting stock.

Good news is also being heard from "Abraham," our old friend, the brown-spot-resistant longleaf at Alexandria, Louisiana. Abraham's offspring are rising above the grass in three years, leaving their less-fortunate cousins in the dust.

At the present time, there are over 5,800 acres of first generation Federal, State, and private forest tree seed orchards here in the South. This number is still increasing, even though second generation orchard establishment has started.

These first generation orchards can be managed for seed production well into the second generation production cycle. They can provide seed for domestic and export needs for many years, and it will be seed of good genetic quality.

More "Purpose Diversity" exists for these new orchards than was the case for the first generation orchards. Increased gum yield, low density, high density, disease resistant, high seed yield, high combining ability, fertilizer responsive, geographic area, and site responsive are some of the types of second generation orchards to be, or already under establishment.

We now have enough information to know that the genetic variability of many traits exists in the southern pines. Changes are possible in height, diameter, volume growth, wood quality, disease and insect resistance, stem form, branch morphology, drouth resistance

and many other characteristics. Often the breeder's objective is to have a combination of these into one package, or strain. The challenge is amplified, however, when a thin base exists such as resistance to fusiform rust. While a broad base is desirable for the propagation of such trees, I believe we will be planting seedlings grown from the seed of two or three resistant clones in some areas.

At any rate, top management must consider genetics in their land management decisions if they are not already doing so. The assumptions for future practices and products are important to the tree improvement worker, for he must decide which traits are the most important. Culture practices? Silviculture treatments? Insect and disease control? Which ones? The genetics of trees is a part of management, and once the decision is reached the genes are fixed for the rotation.

Too, the systems analysis approach should receive more attention with input information on silviculture, harvesting, products desired and biological information coming from the scientists. When this is done, the values that the geneticists and other tree improvement disciplines associate with the various traits may change.

I can't stress enough the role cooperation has played in taking us this far. Almost every seed orchard program in the South has at least one cooperator. In addition to the three large industry-university cooperatives, I can name many organizations that have an agreement signed by two or three parties. In no other area of forestry is the association---and cooperation---of forest management and research personnel so close. All have worked together to develop seed orchards, collect research data and to guide scientists in developing their mission and objectives. Of course, it makes sense because tree improvement is a paying proposition. If forest tree genetics and tree improvement continue advancing, the next generation will realize gains that are hard to imagine.

Of course, there are limits to the extent of cooperation we can expect in the future, due to the expense involved in tree improvement work. Once the orchard is established, the cost has just really begun. It must continue to be managed, progeny must be tested and seed collected. Since much of the costs are fixed for an orchard, large or small, we may see a trend to larger orchards, or smaller orchards within working distance of each other.

The total estimated cost per year for State established and planned pine seed orchard programs in the South, on the basis of 200 selections per State, is \$1,125,500. One million of this is for seed orchard maintenance, which includes seed collection. The cost will probably stay at approximately this figure for the next two to three years and then increase gradually until progeny tests are completed.

As the costs of tree improvement programs are large, I suggest that many of the private tree improvement programs now underway will give way to State-sponsored programs. Gains derived from both the public and the private sectors can be incorporated into State-operated programs. Seedling stock derived from these efforts will be available from State nursery programs for industrial and other private land planting work. Increased competence in both tree improvement work and nursery management will attend State program development, thus insuring continued gains in the quality of future forest tree planting stock.

Again....congratulations. I can't think of any other phase of forestry research that has grown so large so fast. No doubt, reports here during the next two days will annotate these accomplishments in detail. You will also be covering present projects and future plans. On this subject, I have only three points that I might add to your deliberations.

First, we must really work at keeping a broad genetic base in the seed orchards. Many of you will be the first to admit that the base of our first generation orchards could and should have been even broader. Second generation orchards must incorporate the best of the first generation orchards, plus new material. Although there are no hard and fast rules, our knowledge on incompatibilities and other problems suggests that new material should comprise 30 percent or more of the lines uses in the second generation orchards. For some types of orchards this percentage is much too low---perhaps 75 percent would be better.

Second, I would urge the continuation of seeking new plus tree candidates. To be sure, there is not the same sense of urgency to get these plus trees that you all experienced in establishing your first generation orchards. There is, nevertheless, an "Aura of Finality" associated with most tree stumps.' Their usefulness to future tree improvement work is very limited. As the harvest moves across the South again, we must be certain to save and incorporate - into our breeding collections - into our germ plasm banks - the best of the natural populations still available. Once gone, they are gone forever.

Third, some statement should be made about hardwood tree improvement. There is need for tremendous effort over the next 15 years for tree improvement efforts with a number of important southern hardwood species. These include sweetgum, sycamore, cottonwood, tulip-poplar, tupelo gum and cherry-bark oak. As yet there is no good substitute for time in forestry work; thus this time-consuming work must be carried out now to insure the gains we know we will need with hardwoods tomorrow.

And lastly, let's take pride as we move this improved stock into the forestation picture. Make a big thing of it publicly.

Today's emphasis on environmental enhancement, resource renewals, anti-pollution, sound abatement, and the need for expanded forest areas all cry out for your actions. The improved quality trees you are producing blend into that picture with such ease you must emphasize them as they appear. Let's continue to tell the public in a positive way about forest genetics and forest tree improvement. Here are two forestry activities that have, in a few short years, produced results destined to have a profound and continually increasing effect on tomorrow's total renewable forest resource.

We see now that our efforts on tree improvement started none too soon. Projections of supply and demand for wood products in the year 2000 lead to the conclusion that 55 percent of the Nation's wood and wood products must come from the South and this production must come from less acreage than is available for timber growing today. At one time, the year 2000 seemed a long way off, but I guess I'm getting older. It now seems to be imminent. It is particularly so to the tree improvement scientist because, in a manner of speaking, it is only a progeny test and a roguing operation away. More and more people feel that genetic improvement is potentially the most valuable technique available for increasing wood production. Remember when the genetic gain estimate of volume started out at about three percent? Now we hear figures of 10 percent and even as high as 19 percent as progeny test results begin coming in. What will be the results from second-generation seed orchards?

I can assure that your efforts are capturing the imagination of the forestry world. Keep up the good work. The eyes of the Nation are upon you!