

PLANTING THE RIGHT SEED

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The South, already an important wood producing area, is to become the nation's wood basket by the year 2000. Now, if my mathematics is correct, that's less than a southern pine pulpwood rotation away. We are talking about harvesting then, trees you men produced in your nurseries three or more years ago--in some instances, we'll be harvesting then the superior tree progenies yet to be produced, but as certain to come as is tomorrow.

Paradoxically, we'll also be producing that wood on fewer forest acres. The growing realization that sound land use planning must become a way of life in the years immediately ahead also adds its beating and blessing to the picture. Although forestry is not keeping pace in technology with other phases of agriculture, advances are being made. By the end of this century, per acre cropland production, we are told, is expected to increase by 70%. While gains of this magnitude are not predicted for forest land production, realistic gains through the use of improved genetic quality planting stock, intensive culture utilizing high quality sites, fertilization and perhaps irrigation and closer utilization practices could increase wood production on good sites 40 - 50% and more.

An entire area of research not yet tapped in food crop agriculture is that relating to light energy conversion in green plants. To my knowledge, research in this field with forest tree species is just beginning also.

It is generally believed that there are great opportunities ahead for increasing the light energy conversion potential by green plants through selection, plant breeding and genetic studies. Now only about 0.1 percent of the sun's energy received is fixed in photosynthesis. Some scientists believe it is possible to develop plant populations and the technology necessary to convert up to 8-10% of the incoming energy to a unit of land. (5) Hopefully, new superior forest tree selections can and will play an important role in this total process.

Since 1930 nurserymen have been producing forest tree planting stock here in the South from a few hundred thousand to a total forest tree nursery production in 1971-72 of over 625+ million seedlings. Each seedling was the very best available--perfectly suited for the site it was destined to occupy for the next 15-30 or more up to 80 years, depending on whether it was to be a pulpwood thinning, a pulpwood harvest cut or a sawlog. Gentlemen, that's a lot of baloney! Millions of those trees were plain junk--poor quality, low vigor and absolutely

wrong seed source that I just mentioned to meet an order or quota schedule. Some are still doing it. Yes--John Seedlingless up in Transylbovia is out of loblolly pine seedlings and he has orders for two million more. After a few phone calls around, good old Mike Gottafew down in Georgissippi has some. So up they come to Transylbovia for repackaging and shipment to happy tree planters in the hills and dales.

There's another hitch in the process. Mike Gottafew got the seed for his loblolly crop from local seed sources, that is, all except a few hundred pounds he was short which he bought from Sam Seedbyer over in Kentarsas. He'd used all his local seedling locally and was also shipping locally from the Kentarsas seed lots--yep, that's the stuff he sent on up to Transylbovia, too! Wow, a coastal lob to be planted in the lower midwest! Well, we've carried this dialog far enough, but its underlying truths remain. This very thing is happening each year in too many nurseries--and not just here in the South. It must cease! No conscientious nurseryman or nursery superintendent can honestly watch the tailgate lights of a departing truck loaded with seedling stock disappear at his nursery gate and breathe a great sigh of relief unless he knows full well that the stock he has just sent to a planting job is the best quality, finest vigor and absolutely the right seed source available for the planting site it is destined to occupy! Let's look at a few facts.

All of you are aware of the Southwide Pine Seed Source Study undertaken cooperatively by 17 agencies here in the South in 1951. (8) The study was to determine the degree to which inherent geographic variations were associated with geographic variation in climate and physiography for our four major southern pine species; longleaf, loblolly, slash and shortleaf pines. Results of growth data for the third, fifth, tenth and fifteenth years have been analyzed and recommendations which can serve as sound guidelines for seed collections are now available. (2, 8, 9, 10) No one claims that these are the end results but they do give guidelines based on more solid information that was the case when our best advice was "use local seed sources when in doubt." The Southwide Study does indicate that in some areas considerable genetics gain and its resulting volume gain can be attained by utilizing seed of non-local origins. This does not hold true near the northern limits of a species range where no improvement over local sources seems possible.

Quoting from Wells' paper (9) given at the tenth Southern Conference on Forest Tree Improvement in Houston, Texas, in 1969, "there is little or no correlation among the three traits that vary geographically in loblolly--that is, trees with genetic potential for high survival, fast growth and rust resistance do not occur in the same area." He then goes on to show suggested seed collection and planting zones for loblolly pine as well as the three other major southern pine species.

In the concluding remarks in his paper Wells says, "It is evident that the 10-year data on disease resistance and survival for all species are as reliable and useful as anything that is likely to be obtained from future re-examinations. In height and volume growth some changes from present patterns may occur, but the plantings have grown through a third to a half of a pulpwood rotation with no drastic reversals in ranking of individual sources. The basic patterns of variation that first appeared are still present and, most important, there have been no instances of outright cold-induced injury when southern sources have been moved northward within the limits suggested in this paper. Such injury has occurred only in the Missouri, Pennsylvania, and New Jersey plantings, which are the most northern in the study. In other plantings, trees moved too far north have responded only by growing slowly."

He points out severe weather conditions which the test plantings have withstood and ends his paper by stating, "The ability of trees from areas of relatively mild climate to withstand these weather events seems strong evidence in favor of the present proposals for seed movement." I have fifty copies of that paper here for those of you who wish to see more details of these recommended seed sources.

We have spoken largely about southern tree species but we could easily have chosen as examples improvement work and research developed recommendations for other forest tree species in other areas here in the U.S. For example, research on genetic variation in Rocky Mountain Douglas fir (12) has resulted in recommendations for Christmas tree stock seed sources as has work with Scots pine for Nebraska. (7) A central Yugoslavia seed source of Austrian pine for Christmas tree and Shelter-belt use has been identified. (6) Provenance studies on red pine, jack pine and white spruce in the Lake states are well underway and within the decade will provide growth data which will help identify quality seed sources. (3) For example, the proper jack pine seed source can produce trees nearly 30% taller than a local source at ten years. Projected to a 40 year rotation, this could mean an increase return of 28% per acre--and this perhaps could be the difference between profit or loss on the planting venture.

Cal Bey, et al., (1) have published guidelines for black walnut seed sources and the suggested planting range for the soon-to-be-released Stoneville Improved Cottonwood Strain is well documented. (4)

These examples are but a few of the recommendations which have emerged from seed source research efforts. They are ready for implementation now. That's where you men come into the picture.

Until such time as regular seed orchards come into full production, many of you will still need to obtain seed from other sources to carry on with your nursery operations. You each have a full responsibility to insure that you obtain and use only the best quality, site-adapted

seed sources for this nursery production. At last you can be firm--you can often be very definite in specifying seed source. To do anything less will be doing a disservice to tomorrow's forest economy. When one considers the length of time any given acre of forest land is given over for the tenancy of its tree crop, it behooves each of us to insure that that acre has on it the VERY BEST quality tree planting stock available. Yes indeed, your job hasn't really ended when those tailgate lights pass out of your nursery gate--it really has just started another series of events which will carry forward 10, 15, 20 on up to 30 or more years.

There is no doubt that using the right seed source is important--A MUST. To do any less than that is a gross misuse of a trust and a responsibility.

Well, what can we do--what should we do?

Although evidence is beginning to build up in some cases against this axion, it is still a safe starting rule. "Use known good local seed sources;" however, if research has indicated a better source for local use, by all means get that seed source for use locally. "If an agency can afford to expend large sums on a tree improvement program aimed at getting genetic gains in the future, then it can't afford not to spend a very little bit extra this year to buy seed from areas that have been shown to give the same genetic gain." (11)

Don't willingly and knowingly ship inappropriate stock to a fellow nurseryman to help him out! It may help him momentarily but in the long run the loss may be far greater to the forest economy and to the land owner than the small loss sustained by a few beds of seedling plowed under in your state or industry nursery.

Remember that in today's forest tree nursery business, continually improved genetic quality tree seed is emerging at an ever quickening pace. Some of you are already sowing it. Others will have your day soon. But there are still not enough, or for some species, not any improved quality seed for the species you grow in your nurseries. Thus, you will have to get seed from the best seed sources other than seed orchards for these species for some years to come.

To quote Dr. Wells again, "The main point that we have been trying to make with these geographic variation results is that here is an immediately available source of genetically superior seed that we can use during the interim period before our seed orchards come into full production.

"Sizeable genetic improvement over local or randomly chosen seed in rust resistance and growth rate in loblolly pine, and growth rate in shortleaf, longleaf, and slash pine can, in many cases, be made by simple seed source selection. It seems only reasonable then, that any agency that can afford to invest heavily in a tree-improvement program in the hopes, of future genetic improvement can afford to control geographic source of seed to get genetic improvement today." (11)

In summary, let me urge each of you to conscientiously consider these two points:

Do not participate in interstate nursery seed or seedling stock exchanges or sales if you know the stock leaving or entering your state is not suited to its intended planting sites.

Determine what seed sources are NOW recommended for your state and then see to it that these sources are used as the seed sources for your nursery production. We in SPF in collaboration with Research are ready to assist you on this at any time. PLANT the RIGHT SEED!

If you will each vow to adhere to these two points, you can rest assured that your blood, sweat and tears, yes your Bromides, Spirits and Tarps have not been spread in vain!

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