Selection, Scoring, Protection And Use Of Superior Trees

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The steep rise in the consumption of timber, and the rapid depletion of good individuals in the now seed-producing population, coupled with the fast diminishing amount of woodland available for purchase, has focused our attention on the improvement and development of that which we already have. In many ways the industry is being forced into a crash program. This sense of urgency should not, however, unduly hasten us into a make-do selection of the "next best" breeding stock. Careful screening of the best selections from existing stands should give us something really valuable to work with in the future. Once selected, the superior trees will cost no more to handle in the seed orchards than average trees for breeding stock.

The program of examining, selecting, scoring, protecting and using superior trees is not one to be viewed lightly. Such a program is a long-term undertaking with potentially far reaching results to the pulpwood industry; therefore, in a program of forest tree improvement through genetics, the cost which is inevitable, should be viewed leniently, in an effort to obtain the best from existing stands.

It is hoped through genetic selection we will obtain trees that are faster growing, disease and insect resistance, smaller and more efficient crowns, smaller limb diameter and flatter branching, greater height average, higher specific gravity and larger cellulose yields per individual tree. To obtain these things through selection, the following general loblolly pine characteristics are sought for the parent stock. Taller or equal in height of the stand, branching at right angle to the bole with branch diameter and length smaller than comparable trees, dense crown occupying not more than 25% of the bole height, straight bole of high form class, good pruning ability, disease free, and comparable in volume.

In order to find parent stock meeting these requirements for North Carolina Pulp Company it is necessary to examine many climatic and geographic stands and numerous sites intensively, both in the Coastal and Piedmont areas, since our company holdings are in both. We are developing North Coastal Loblolly, South Coastal Loblolly and Piedmont Loblolly seed orchards.

The actual selecting of trees for seed orchards is no easy task; pressured from above for results, pestered with ticks, chiggers, yellow flies, gnats and mosquitoes, and plain scared of snake bite, you sally forth acres to cover and miles to go. The first days are utter confusion with a kaleidoscope

of words; spiral, compressed wood, cronartium, ununiform, unicorn and outvolumed all adds to the frustration. Never have I realized a tree was so imperfect. Into another stand the search is continued with exasparating results. A smoke break is taken, the mind begins reevaluating the words "Look for the outstanding tree", during this pondering the eyes are raised and one gaze into the distance, suddenly the realization, yon stands a tree not exactly the pattern of the majority of the stand, pulse quicken, a quick trip over and behold, the outstanding tree. With greater confidence we begin to examine the stand with a more understanding eye. The period of selecting has begun and with each selection comes more confidence. Each stand is examined much on the order of a 100% cruise, by beginning at an easily identified break in the woods, topography, or landmark and worked systematically in tiers or strips until covered. This is necessary to avoid duplication and not to overlook a prospective candidate that may be indiscernible in a uniform even-aged stand.

During my initial search, I take the following equipment. Pencil, tatum holder with select tree rating sheets, spray gun filled with paint, crayon, aluminum tags, compass, diameter tape, Abney level, nails, increment borer, and of course a machette. On the grading we use the same equipment plus soil anger, bark depth gauge, and a man size increment borer, that quickly separates the men from the boys.

Trees that are satisfactory (or that have an acceptable grade) are very rare; it is essential therefore, that the selector go into many stands to find them. He must be very critical and cannot be satisfied with mediocre trees, it is my belief that better trees are to be found. Since we know only that the progeny will eventually be planted on our lands graded roughly into North Coastal, South Coastal and Piedmont, it is desirable that our selections come from a variety of sites within the broader classifications listed above.

In the selection of trees our best results have come from even-aged stands, both large and small, and mixed stands of Loblolly and Shortleaf. Old field stocking usually seeded from hedge row and wood edge trees have consistently given poor results.

As I go through the woods searching a likely stand the first thing I look for is crown, the next straightness and in order; pruning ability, branch diameter and limb angle. Usually a tree with the above characteristics has superior or equal form class in comparison with the best crop trees within the select tree stand. In judging a selected tree for superiority, we have found by picking five dominate crop trees of the stand, with nearly as possible comparable characteristics to the selected tree, and averaging and comparing to the same characteristics of the selected tree, we come up with a fine specimen. Crop tree selection may go out as far as 100 feet, but confined to the selected superior tree stand and site.

I prefer the 40 to 60 year old class because of my belief that a tree must attain this maturity to demonstrate its fullest superiority, although our rotation age is younger. By using trees of the 40 to 60 year old range for parent stock, I feel we are getting a more reliable stock for propogation.

Our larger and better stands have been found in Coastal Carolina. In this area trees of high superiority have been selected in stands as small as 1 acre. Avoidance is made of all areas where any thinnings or cuttings have taken place within the immediate generation. Areas cut to seed trees are ignored even though the best the previous stands offered are left, this due to insufficient comparable crop trees. Creek bottoms and sites of unusually high index are examined with caution, due to site being better than average in comparison to where progeny will eventually be planted.

In the Piedmont section different problems appear; suitable stands to select from are smaller, sites are more strictly confined, extremes are encountered from poor to excellent stands, stands are widely scattered, mixed loblolly, shortleaf and Virginia pines stands are prevalent, and larger crowns seem the rule.

Most of the woodland in the Piedmont area is privately owned. This presents a problem of trespass. We first secure permission from the owner to look through his woods. To determine who the owner is, we visit the County Agent, County Firewarden or ASC Manager's Office. The owner is then contacted with the following introduction: "Mr. Doe, I am Orion Peevy of the North Carolina Pulp Company. We are working in cooperation with State College, on a program of Forest Tree Improvement. I would like your permission to look through your woods for a superior pine tree that might be included in this program."

This works very well--but, he usually asks "What kind of a pine is that?" Other incidents, some insist on accompanying you, this slows you down and one usually has to give with conversation and being the nice fellow, another will steer you around, (and for a very good personal reason), a very likely looking stand near a creek. Only in one instance have I been refused, after going into all the explanations as to selection, marking and use, this gentleman and his FFA son stated bluntly, he was on a timber deal advantageous to him for some 300 acres, and he feared a tree, marked with yellow paint, might lead the prospective buyer to think other buyers had been in the timber and offered less than he had for the timber, thus disrupting the sale.

The selection in Piedmont stands is made in the same manner as for Coastal Loblolly. When a tree with the desired characteristics is found, it is usually more outstanding in the stand than one in the Coastal area. The select tree is always judged in relation to the 5 best crop trees available.

Following are some of the characteristics judged in the grading: Height should be not less than 10% of average crop tree, and scored 0 to 7 points, depending on site index and age. Form Class is determined by form paint method, the select tree being given 1 point for each form class greater than average less 1 point. Branch diameter and angle, from average to relative small, and flat respectively, 0 to 2 points. Crown Radius is judged subjectively, the individual select tree being compared to the 5 crop trees and scored 2 to 1 point if large for bole size and competition, 0 to plus 5 points if average to small for bole size and competition. Pruning Ability, the ability of the select tree to shed its lower limbs (dead or alive) when average or above checks, is given 0 to 3 points, the select having to be better than 3 checks. Straightness is judged subjectively for the individual select tree and not compared to the checks. Excess spiral and/or crook in two planes is not acceptable, nor crook in any one plan which will not allow a line from merchantable top to stump to stay within the confines of the bole; straightness scored 0 to 5 points.

In order to be acceptable to our company a tree must score a minimum of 10 points; Volume superiority is desired, but more as a bonus than as a basic characteristic. The importance of volume in determining superiority must be clarified, and its application understood, between cooperator and grader, otherwise the cost of search may be greatly increased.

We desire trees of high specific gravity and this is determined by wood samples taken with oversize borer. These cores are also used in determining cellulose yield and fibre length. The laboratory work being done by State College. Core holes are plugged as protection against insects.

All selected trees are tagged, banded with paint and given a company number. Check trees are numbered and sketched on a data sheet showing location to select tree. A trail is brushed out to an easily recognized landmark and spotted with paint. This select tree location is given to the landowner, and on company land to the District Forester, who is cautioned to preserve it under all circumstances. A map sheet gives owner, county, location, state, the company and Association clone number. The careful marking of the selected tree and brushing out of trail is repaid many times on later trips for grading, cone collection, scion collection, and wood core for laboratory studies.

The accepted tree is left intact until such time as we desire scions for propogation. Then we shoot limbs with the required number of scions from top half of the crown, using a .218 caliber rifle equipped with 4-X telescope. The scions are then selected and immediately cut and placed in polyethylene bag containing sufficient damp moss to prevent drying out, which is punctured for air circulation. The scions are taken to grafting site, each bag of scions being identified by placing inside bag aluminum tag with the clone number on it.

When grafted and placed in the orchard the graft is tagged with the respective clone number and staked.

In shooting out the scion material care must be taken to do the least damage to parent tree, since we have found it frequently necessary to go back for additional scions. In searching for select trees we sometime locate exceptionally good stands which then are marked as a seed production area.

Summary

The steep rise in the consumption of timber, and the fast diminishing supply of quality seed source has focused out attention on the development and improvement and improvement of that which we already have, through genetic selection. The program is long-termed and costly, yet rewarding in the fact we will have something really valuable to work with in the future and provide us with improved planting stock during development.

Selection is hard, and time consuming, necessitating going into many climatic and geographic similar stands and sites over a wide area. Although the standards are rigidly set for several characteristics, such trees are found occasionally, my average runs about 2 per week.

Our best results have come from even-aged stands of Loblolly pine. Experience and care pays off at first I located many non-usable trees, now with the same effort and better understanding of the grading a much larger percentage is acceptable in the final grading.

Efficiency is gained by delineating stands, then systematically searching them. Certain standards for grading of tree are necessary and for convenience these are applied in the form of points, plus or minus, as compared to 5 crop trees.

After superior tree is selected and scheduled for inclusion in seed orchards, certain precautions are necessary to protect its identity, location and use.