

Certification Standards for Forest Tree Seed in the South

By John Barber

The South leads the country **in nursery** and planting programs. To give you some idea of the size, during the 1958-1959 planting season, the South planted about 1.6 **million acres as opposed to 194,000 west of the Great Plains**. The aggregate total of the **plantations in the South at the end of that season was approximately 7.9 million acres in contrast to the 1.5 million in the West**. In 1958 the **total nursery production of the 12 southern states was about 1 2/3 billion trees**. Using conservative estimates, **there were probably over 200,000 pounds of seed used for nursery planting that year**. When we add the seed used in direct seeding programs the **total seed consumption in the South for the 1958-1959 planting season was probably in the vicinity of 300,000 pounds**. The top ten states in nursery production for the 1958-1959 season were **all** located in the South and together they produced over **sixty** percent of the planting stock in this country. The nursery and planting **program in the South** is a tremendous undertaking and with it goes the attendant problems of seed procurement and handling.

Seed procurement in the South is a **headache just as it is everywhere**. To sustain a nursery and direct seeding program which is consuming 300,000 pounds of seed a year, it is always necessary to set a collection goal far in excess of **that figure**. Southern pines have periodic cone **croops with intervals of one to eight years**. 1956 was a season in which the cone crop was a total failure in

most of the South. In the spring of 1957, there was a great deal of searching for seed to supply the nursery program but adequate quantities were not available locally. The nursery requirements were filled by borrowing seed from those who had excess in storage, primarily Georgia and the Ashe Nursery. Undoubtedly, some of the seedlings from this borrowed seed were planted in areas where their performance will be below that of local sources. As a result of this acute shortage, probably a million bushels of cones were collected in the bumper seed year of 1957. As you can well imagine, there was a scramble to get every cone available. That year, as in most other years, little concern was given to the individual trees from which the seed came and in some instances there was little regard for geographic origin. While we may not have the elevation problem which appears so acute here in the West, we have all of the other problems related to source and some related to soils and drought resistance which may be more complex than elevation.

There has been considerable change in cone procurement policies in recent years. In many cases, cones and seed are being collected in the general geographic area for which they will be used. In Georgia and some of the other states, the seedlings are, in general, returned to the same area of the state from which the seed were originally collected.

We have adequate evidence to prove that we have differences in the performance of our southern pines which is due to geographic source. In a 22-year-old loblolly plantation made up of 4 sources, Wakely 1/ showed a range in volume of 15.4 to 41.8 cords per acre and a range in fusiform rust infection of 4 to 37 percent. Perry and Wang 2/ took these figures and showed that the loss from planting the poorest source when converted to seed values represented \$600 per pound. Current studies indicate that geographic distances much less than the 350 miles in Wakeley's study may mean big differences in performance and further, that the differences between the progenies of individual trees within a stand may be of greater value than many of the geographic differences. The ideal, of course, is to determine the best geographic source and then obtain seed from the best trees in that source.

It should be remembered that most southern timber stands are second, third, or fourth growth and that past logging and naval stores practices have been high-grading so that in general only the poorer-formed, slower-growing trees were left for reproducing the new stand.

^{1/} Wakely, Philip C., 1954. Planting the southern, pines. Forest Service. U.S. Dept. Agric., Agricultural Monograph No. 18, 233 pp.

Perry, Thomas O. and Chi-Wu Wang, 1958. The value of genetically superior seed. Jour. Forestry 56(11): 843-845.

The seed laws in the South applying to tree seed are quite irregular some states having none, other states such as Georgia having relatively strict laws. Tree seed are covered under the Georgia law in rather general terms which require a seed test within nine months on any seed sold in the state and correct labeling as to geographic source. The Georgia Seed Law fixes responsibility for mislabeling, provides that the enforcement officials can inspect any phase of a seed operation and requires that seed dealers be licensed. We are now in the process of having the Commissioner of Agriculture promulgate additional regulations which will go into much further detail, stating specifically how the seed will be labeled concerning origin, the name of the collector and the details of the official seed test.

The certification programs in the South are designed to consider the parent trees from which seed are collected, really the most important thing. The Society of American Foresters has been a major force in the development of the seed certification programs in the South. Much of the work 'has been done through section and chapter committees. In Georgia, the legal seed certifying agency is the College of Agriculture. (Under the Federal Seed Act, a certifying agency must be established by state law to be recognized). It has designated as its agent, the Georgia Crop Improvement Association, which is a nonprofit corporation organized to provide"... through certification, high quality seeds and propagating materials of superior varieties so grown and distributed as to insure genetic purity and identity." As a matter of interest, all western states have similar arrangements for certification of agricultural crops. In some states where the general seed laws do not cover tree seed,' the legal authority for the certification agency is such that a certification program for tree seed could be established with full authority for enforcement.

The seed certification committee of the Georgia Chapter, Society of American Foresters, approached the Georgia Crop Improvement Association on the matter of certifying tree seed because they had the necessary administrative organization with many years of experience, and they also had the necessary legal authority. The Crop Improvement Association accepted tree seed as a commodity on the same level with other crops and the committee of the Society was selected to become the Forestry Commodity Committee of the Crop Improvement Association. This committee continues to serve in its dual function. It prepared a set of standards for certifying tree seed which were approved by the Georgia Chapter of the Society of American Foresters and then adopted by the Crop Improvement Association. All technical matters relating to tree seed are handled by foresters. Our standards have been in operation over two and a half years and the first crop of Certified Seed will be collected from seed producing areas next month.

Under the Georgia Certification Standards, the minimum requirements for the producing trees are spelled out in detail.

Our most important southern pines are similar enough **in** growth habit, form, etc., that the same **general standards can apply to all of them.** They describe the straightness of stem, crown form, disease resistance, etc., which a tree must possess **before it can remain on an area for the production of seed.** The standards also provide for isolation strips to minimize the amount of **contaminating pollen.** Our standards provide for the certification of seed from seed production areas, seed orchards, **and** elite trees. Under the Georgia Standards, certified seed fall into three categories: Class I will be seed from seed orchards produced by trees or clones which were rigorously selected and have been progeny tested. Their genetic worth will be known. Class II seed will be produced from similar areas where progeny tests have not been completed. Class III seed are those which come from seed production areas where **the stand has been rogued to meet the standards of the Crop Improvement Association, but** where progeny testing is **not contemplated and,** of course, the selection cannot be as rigorous as for seed orchard clones.

An additional category of seed is termed "Approved Seed". (The term "**Verified Seed**" has been suggested elsewhere for this type of seed.) This class of seed is produced from trees which are comparable to those remaining in a **seed production area,** but are located **in a stand where roguing has not been done to remove all other lower quality individuals** which might pollinate them. While we cannot expect as much genetic improvement **from** seed of this category, it **certainly will be much better** than the material **m are** now using.

Various State Crop Improvement Associations or their comparable organizations have banded together to form the International Crop Improvement Association which facilitates the movement of seed across State lines. Through this organization, seed can be produced in one state and **marketed in** another as Certified Seed with the national organization handling the administrative details to insure that the seed meet the standards of the state in which they are sold. Last year at the meeting of the International Crop Improvement Association, it was determined that there were at least three states which had standards for tree seed. Therefore, action was taken to adopt broad minimum standards to **serve** the nation. As you know, this is quite a controversial issue at present. These broad I.C.I.A. standards are designed to serve as guidelines within which each state or agency must construct detailed standards to meet their **individual situation. The States will have to spell out in detail the requirements for each species or group of species to fit the local situation. Certainly the standards which might be prepared for ponderosa pine in Montana would not be suitable for use in Texas or Southern California. It is even conceivable to me that standards might vary within a State for a species like Douglas-fir or ponderosa pine. The key to a successful certification program lies in the hands of the foresters working with certifying agencies at the state level.**

Certification should strive for ;the improvement of the genetic quality of the seed and **planting stock we use. Correct lgollaa of seed as to** source and quality is a first big step, but this makes it possible only for us to avoid loss from **using** the wrong source; there is no opportunity for us to gain because we should already be **using the** correct source. Certification can provide us with a gain **because it** can make available seed of improved genetic quality, seed not now **available** from existing sources.

Discussion on the Preceding Panel

Jim Augenstein raised the point that better germination information is needed as a more reliable control of **nursery sowing to** obtain the desired seedbed **densities. This** subject was passed back and forth to **some length. It was impossible to** obtain an **accurate** recording of all of the comments. The subject includes facets such as the guarantee of germination **percentage by** bidders on certain seed lots, the maintenance of viability during storage under different methods of storage and during the shipment of seed from the supplier to the user.

It is apparent **that** there is a great deal of difference between states and certifying **authorities in** the requirements for germination tests and the certification of germination percentages. It was brought out that the method of sampling has a great deal **to do with the accuracy** of these determinations within specific lots of seed. There are also many **differences** between the requirements of seed purchasers. In the final analysis it was the consensus that seed testing for viability should be standardized to the greatest extent possible. It is highly important that the method of testing be known to the purchaser and that he should be given the most reliable germination data on the lots of seed he purchases that is consistent with the methods used and the economy of the operation. Further than that the nurseryman must be prepared to have **his own tests run** and to correlate these tests with his field sowing on the basis of his experience as related to actual field germination. It is true, of course, that the more consistent and reliable the germination data furnished him can be, the easier this coordination will be to accomplish.