

TECHNICAL COMMITTEE REPORTS

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REPORT OF THE NEFTIC COMMITTEE ON TREE SEED CERTIFICATION

Our Committee has presented a report of activities in this general field every year since its organization in 1954 with one exception. However, this is the first year that enough allotted time has been given so that the whole Conference can discuss some of the problems and issues confronting this Committee. We are thankful for this arrangement and have prepared this report in advance so that all the members will know its contents before it is presented. We hope you will read it carefully, make notes, and write questions down ahead of time so that we may have a good discussion on the morning of the presentation.

This Conference is represented by many states including administrators, foresters, and research workers of varied interests both from public and private interests. We believe our once-a-year meeting should be a time for presentation of progress in tree seed improvement for the year within our area, a time for an exchange of ideas of how we can best improve seed standards generally, and an opportunity for each of us to learn what other workers, institutions and states are doing or propose to do in this field.

In 1954 we were asked to study the adequacy and accuracy of seed dealer certification and labeling and suggest ways to improve the situation we were asked to study the need for tree seed certification, suggest an organization to carry this out and suggest a region-wide seed policy. We were also asked to collect and study superior seed sources.

Some of your Committee members have been active in one or more of these projects for several years, and we have given brief annual reports for your information. However, in order to make progress in this tree seed improvement field some united action must be taken by this Conference. Why do conditions exist today in tree seed channels and commercial exchanges much as they did 20 years ago or as they did in 1954 when this Committee was organized under C. E. Farnsworth as chairman? Each member should ask the following question of himself, his affiliated organization whether it is a college, state, U. S. government, or private institution: What are we doing to improve tree seed quality and seek better known sources for all growers and planters throughout the region and also throughout the United States?

This year's report will be divided in two parts. Part I will cover the general field of tree seed improvement studies, certification progress to date, and recommendations of your Committee for action by this conference both now and in the future. Part II will be presented by E. J. Eliason and will cover some progress being made with the establishment of tree orchards for the purpose of the production of certified tree seed in the future.

PART I

This is a summary of progress and information gathered to date, and recommendations to this conference for discussion and united action.

Testing Seed Sources of Scotch Pine and Douglas Fir

One of the original assignments was to collect information on superior seed sources. The Christmas tree growers particularly in New York and Pennsylvania, have been pressing for information on the best sources of these two species for Christmas tree production. Studies have been carried on by the Chairman for 15 years in an experimental nursery and in field plots cooperatively by various growers and institutions for 3-5 years. Much of the information on winter coloration, rate of growth, length of needle, etc., has been published for the growers use or presented in talks through slides and discussion groups.

Well over 100 known lots of Scotch pine including seed sources from Austria, Belgium, England, France, Germany, Greece, Italy, Norway, Poland, Scotland, Spain, Sweden, Switzerland, Turkey, Yugoslavia, and several states and growers strains from the United States have been grown and studied for color and growth characteristics for 1 to 4 years in seedbeds and transplant rows. Sources from a single country have been found to vary widely. Height growth in one seed source series as 2-2 transplants varied from 1 to 3 feet, needle length varied from 2 to over 4 inches, and winter coloration was yellow to blue-green.

Douglas fir seed sources have been grown and tested for coloration, rate of growth, winter hardiness and late spring frost damage. Sources have been grown and checked from Washington, Oregon, Idaho, Montana, Wyoming, Utah, Colorado, Arizona, and several areas of British Columbia, Canada. These sources have included both the so-called viridis, caesia, and lauca and strains and geographical mixtures of them. The most western viridis sources from British Columbia, Washington or Oregon were not winter hardy. Some of the inland viridis and caesia sources from Idaho, Montana and Wyoming were terrifically slow-growing while others from British Columbia and Oregon areas were found to be hardy, fast growing, and excellent for Christmas tree planting. The blue (glauca) sources of the large Rocky Mountain region from Montana to Arizona were winter hardy but varied in the rate of growth, needle color and characteristics. Two-year seedlings from the various sources growing side by side have varied in height growth from 2-3 inches to as much as 12-18 inches.

Individual detailed findings on winter hardiness, growth characteristics, and general desirability cannot be presented in this report, but the firs, spruces, and pines (listed on page 69) have been grown, tested in the nursery, and distributed to Christmas tree growers, arboretums, and institutions for further study.

Some of these have shown real promise and have excellent form and coloration for various purposes. We believe some of these should be used in the future tree breeding program. One of the most promising exotics to date is the Balkan or Bosnian pine (*Pinus leucodermis*) which is slow growing, short needled, dark green in color and is a native of the high mountain region in Greece and Yugoslavia. Other species worthy of trial and showing exceptional individual characteristics are Ernest fir, grand fir, Mayriana fir, Nikko fir, noble fir, Veitch fir, Sachalin fir, Alcock spruce, Koyama spruce, Oriental spruce, Serbian spruce, bristlecone pine, Himalayan pinyon pine. Of all the firs tested Nordman fir was most sensitive and most severely damaged by spring frost.

<u>Abies</u> <u>borisii</u> regis - King Boris fir	<u>Picea</u> <u>glehnii</u> - Sakhalin spruce
" <u>ernesti</u> - Ernest fir	" <u>jezoensis</u> - Yeddo spruce
" <u>fraseri</u> - Fraser balsam fir	" <u>koyami</u> - Koyami spruce
" <u>firma</u> - Momi fir	" <u>omorika</u> - Serbian spruce
" <u>grandis</u> - Grand fir	" <u>orientalis</u> - Oriental spruce
" <u>homolepsis</u> - Nikko fir	" <u>polita</u> - Tigertail spruce
" <u>lasiocarpa</u>	" <u>pungens</u>
<u>arizonica</u> - Corkbark fir	<u>glauca</u> - Colorado blue spruce
" <u>magnifica</u> - Red fir	
" <u>mariesii</u> - Maries fir	<u>Pinus</u> <u>aristata</u> - Bristlecone pine
" <u>nordmanniana</u> - Nordmann fir	" <u>edulis</u> - Pinyon pine
" <u>procera</u> - Noble fir	" <u>monophylla</u> - Singleleaf pinyon pine
" <u>sachalinensis</u> - Sakhalin fir	" <u>griffithii</u> - Himalayan pine
" <u>veitchii</u> - Veitch fir	" <u>halepensis</u> - Aleppo pine
<u>Picea</u> <u>bicolor</u> - Alcock spruce	" <u>leucodermis</u> - Balkan or Bosnian pine
" <u>engelmannii</u> - Engelmann spruce	" <u>thunbergii</u> - Japanese black pine

Rules for Testing Tree and Shrub Seed

We must have uniform testing methods for tree and shrub seed which are officially recognized as rules so that all laboratories can test for germination, purity and trueness-to-name. The Association of Official Seed Analysts have a committee preparing a final list of methods for adoption at next year's annual meeting. This list covers over 100 species and copies will be sent to those desiring the present tentative list of germination methods. All seed collected, sold or planted should be tested for germination and each member of this Conference has a responsibility in this tree seed quality improvement field.

Tree Seed Certification Standards

Within this Conference now we have an organization to certify tree seed. Tree seed certification standards have been promulgated in New York by the Commissioner of Agriculture and these standards have been published since 1960 in the Seed Certification Handbook of the New York Certified Seed Cooperative, Inc., Ithaca, New York, which is the official certifying agency in New York State. The State University College of Forestry at Syracuse cooperates with this agency in handling field inspection of the certification program. Seed standards have been promulgated for Norway spruce, white spruce, red pine and Scotch pine. Our Committee recommends this plan of tree seed certification be promoted and adopted in other states within this Conference. With such a program both interstate certification and international certification of tree seed is possible.

Promote Better Seed Quality, Uniform Legislation, Uniform Testing Methods and Encourage Compilation of Research Information and Activities in Tree Seed Improvement

Your Committee requests your interest and cooperation in this program as we feel that no real progress can be made unless this Conference takes action both individually and as a group once a year. Report the progress and information presented at our annual meetings to your associates when you return to your duties or organization. Stimulate interest for action along these same lines on your job to improve seed quality.

Particularly request action in the labeling requirements for tree seed which is being sold or transported from state to state as tree seed is often shipped great distances. How many of you are familiar with the New York State Seed Law and the labeling provisions for tree seed? Recently Massachusetts and Pennsylvania have enacted tree seed provisions in their seed law. Georgia and Michigan also have tree seed labeling provisions. These should be uniform within a region and also within the whole United States as much as possible. Our Conference should promote uniformity in labeling provisions for tree seed and we recommend the New York provisions as a pattern for other states to follow. Copies of these regulations are available from your Committee Chairman.

Also, we must request from our supplier complete labeling of tree seed we buy or plant both as individuals and as a representative of a state, commercial nursery or private organization. We must also educate and inform our associates and friends to do likewise.

Proposed Amendments to the Federal Seed Act

In 1954 our Committee was asked to check into the need for better labeling practices and possible correction of them, if needed. In 1955, C. E. Farnsworth recommended expansion of the Federal Seed Act to provide uniformity in labeling of tree seeds within the United States. He suggested this Conference should join similar organizations to urge such corrective legislation. We as an organization have done nothing to date, At the 1960 meeting our Committee recommended uniform labeling state laws for tree seed and that a Federal law be encouraged to regulate the importation of better tree seed into this country. Nothing has been done along these lines.

Do you know that old, weak or even dead tree seed can be imported into this country from foreign sources without even a required germination testing program or germination standards? Do you know that mislabeled or misnamed seed can be sold in this country without any protection to the buyer or planter? Your Committee can cite many examples of these circumstances.

Your Committee is well aware of the seriousness of the present situation and has studied it carefully for several years. We have accumulated research data, facts and figures to substantiate these claims. Tree seed quality will be greatly improved and trueness-to-name labeling will be corrected for all users of seed in the United States if the following two provisions are enacted into the Federal Seed Act. Your Committee recommends that the Federal Seed Act be amended to accomplish the following:

(A) Prohibit the shipment of tree and shrub seeds into any state unless the seeds so shipped conform to the requirements of the seed law and rules and regulations pertaining to such seeds in the state into which the seeds are shipped.

(B) Prohibit importation into the United States of any tree and shrub seeds which fail to meet minimum standards of purity and germination to be established by the Secretary of Agriculture.

We hope this Conference will discuss these proposals and give support to them as they are of prime importance and one of the first steps in securing higher quality seed of accurate name and origin. It will be necessary for us to cooperate with other organizations interested in better tree seed in order to accomplish this task.

Part II

The New York State Tree Seed Certification Provisions which have been in effect since 1960 requires that four categories shall be recognized in tree seed certification. Two of these are concerned with seed produced from seed orchards namely for superior and selected seed, one for source information only, and one for seed produced from a designed seed production area where the undesirable trees have been removed.

New York is following a vigorous program of seed orchards in cooperation with the New York State College of Forestry at Syracuse, and is also attempting a program of converting other areas for seed production. All of these are programs designed to produce certified seed in accordance with the state seed law. This program in addition to actual production is a demonstration to other agencies, and especially to private individuals of the process necessary to produce certified tree seed. Details will be presented of the actual experience of converting two rather small plantations into seed production areas which are expected to produce certified tree seed in future years.

The plantations are of red pine and Scotch pine. The red pine trees were planted in 190 from seed collected in the Adirondack area of the State and represent a seed lot which contained several hundreds of seed trees and did produce millions of trees for general distribution. The conversion work was accomplished in 1959. The special area is located in Otsego County State Reforestation Area No. 13. The area in 1959 contained 737 trees per acre on 10.6 acres. When the selection and removal was complete 29.5% of the trees remained, or 225 per acre.

The cone crop trees were selected on the basis of good form, good growth, without apparent defects, and with evidence of flowers or cones. The distribution of those finally selected was somewhat irregular, since the most desirable trees did not naturally fall into the most ideal range of distribution. It is planned to reserve additional trees as the present ones close in. The general idea is to leave the best trees for cone production as can now be judged, and to give these trees ample growing space.

In the first operation all trees over 12 feet high were top pruned. Later some trees were topped to a height of 7 or 8 feet, the theory being to develop the few lower whorls as the basis for the seed production, and at the same time keep the growth down for easy reach for cone collecting. The high topping of 12 feet was not very effective, as the next laterals soon replaced the removed leaders. The severe topping to 7 or 8 feet radically reduced the tree height and is expected to keep the tree low, without too much subsequent topping. This area is not only expected to produce seed "commercially", but also will act as an experimental area for this topping work, and for the use of fertilizer trials and other methods to increase cone production.

The cost of this conversion in man-hours was 492, including labor and supervision. Some additional travel costs brought the total to \$941.28 or \$88.00 per acre. The economics of such an operation depends upon many intangible factors which will not be discussed here. The red pine trees were selected for better timber, while the Scotch pine area was selected for Christmas tree production mainly, and thus the selection characters which tend to make high grade Christmas trees were used, such as slow growth, needle retention and branch angle and density. The source used was one which had remained green during the winter season, so that this factor was considered only for the darker green or bluishness which was used when a color choice was available. The better forms for timber production were also considered in case the trees produced are not used for Christmas trees.

The Scotch pine plot was planted in 1949 with seed marked "Danish" but the actual source is unknown. The six acre plot is located in Schoharie County on Reforestation No. 20, The plot contained several hundred trees but after selection and cutting contained only 90 trees per acre Except for a few trees the tops were removed to 7 or 8 feet The hardwood brush was removed with the axe, and all stumps and remaining trees killed by 245T brush killers. In future years the open spaces not filled in will be planted with trees of the cone collections.

The cost of this area conversion was 508 man hours or a dollar cost of \$150.00 per acre including supervision and travel Again, how does the cost compare with the gain? At present Scotch pine seed is sold for Christmas tree purposes, which are supposed to be green, at \$25.00 per pound, but a much better color and form could be assured under the certification program.

How much seed can we collect per acre? European experience indicates up to 20 lbs per acre per year. We might expect older trees over the years to produce more This summer we collected the cones on an open grown Scotch pine tree whose top had been injured and with lateral branches to the ground spread to a diameter of 13 feet and some 15 feet high. It yielded just less than one bushel of cones, which were picked by hand in one man hour's time. A hundred such trees per acre would yield some 50 lbs of seed, or produce a million seedlings. Again, what is the cost of certified seed?

E.C. Childs
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