TREE AND SHRUB SEED CERTIFICATION IN THE GREAT PLAINS

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Introduction

Although my presentation has been given the title "Seed Certification in the Great Plains," it will concentrate almost entirely upon certification activities in the two Dakota's. North and South Dakota are the only states in the Central and Great Plains regions to have instituted certification programs for tree and shrub seed. I hope some additional publicity will give these programs a boost and will stimulate other states to develop a seed certification program of their own.

South Dakota has had a certification program for a number of years, but it was developed primarily for the certification of two species - Siouxland Cottonwood and Chinkota Elm. After North Dakota developed their program, South Dakota revised theirs, using North Dakota's as a model. Since I am more familiar with North Dakota's program I will discuss it as an example of how such a program might develop.

History

Past Seed Collection Practices

Nearly all of the tree shrub planting stock sold in North Dakota for other than ornamental purposes is grown in two nurseries, Conifers are grown by the North Dakota State Forest Service at their Towner Nursery. The Association of Soil Conservation Districts grows deciduous planting stock at their Lincoln Nursery in Bismarck. Both of these nurseries are essentially non-profit, public service oriented operations. Both of these nurseries obtain seed in a variety of ways: (1) collection by their own crews; (2) purchases from local seed collectors; (3) purchases from large seed dealers. Procurement of adequate seed supplies is often difficult for many species and as a result, the genetic quality of the seed is often ignored.

Problems Arise

Since the consequences of potentially dysgenic seed collection practices are usually indirect and are deferred over a long period of time, their importance has not been fully appreciated by nurserymen or consumers of planting stock in North Dakota. Most of the planting stock is used for non-commercial plantings such as farmstead shelterbelts, field windbreaks and wildlife plantings. Lowered survival, reduced vigor or susceptibility to pests, do not result in a direct economic loss. The prevailing attitude has often been "if the seed will produce an adequate number of

of trees that will meet minimum grade standards, and is not expensive, then it is good enough".

Action Initiated

Recently, however, the consequences of ignoring the genetic quality of seed have become apparent to a variety of people concerned with tree planting in North Dakota. The North Dakota Farm Forestry Committee, an informal association of Federal agencies, State agencies, nurserymen and other groups interested in promoting tree planting, became concerned with the genetic quality of the trees being planted in the state. A Tree Improvement Subcommittee was formed to promote and coordinate the development of genetically improved planting stock. The development of a seed certification program for tree and shrub species was chosen by this subcommittee as the most efficient means of achieving their objectives.

Certification Program Developed

The research geneticist for the USDA - Forest Service, stationed at the Shelterbelt Lab in Bottineau, North Dakota, at that time, yours truly, was assigned the task of reviewing the present status of tree seed certification in the United States and developing a proposed program for North Dakota. This task was accomplished and the proposed program was reviewed and revised by the entire Tree Improvement Subcommittee.

The North Dakota State Seed Department, the State agency responsible for certification of agricultural seeds, was invited to review and comment on the proposed certification program. In addition to suggesting several minor changes in the program, the State Seed Lab volunteered to administer the program as a normal function of their department. Seed Department officials emphasized, however, that they would have to rely upon forestry professionals within the state for assistance in areas such as field inspections. The revised and approved North Dakota Tree and Shrub Certification Standards were published by the State Seed Department as a supplement to Bulletin 51, "North Dakota Seed Certification Standards."

Program Description

Certification Categories

The certification standards adopted by North Dakota are modeled after those proposed by the Society of American Foresters. The Association of Official Seed Certifying Agencies, and the Organization for Economic Cooperation and Development.

Three classes of seed may be certified in North Dakota. The classes differ in the amount of effort necessary to produce them and in the degree of genetic improvement they represent.

1. Source - identified seed (yellow tag)

   Source identified seed is certified as being harvested from trees growing in a specified geographic location. The trees may be growing in natural stands, plantations or shelterbelts. This class represents the first step in the genetic improvement of tree and shrub seed by insuring the accurate designation of the area from which it was harvested.

2. Selected Seed - (green tag)

   Seed certified as selected is harvested from rigidly selected trees or shrubs that have promise of genetic superiority, but that have not yet been tested. The trees or shrubs may have been selected as superior for one or more of a variety of traits such as rapid growth, resistance to insects or diseases, fruit quality, or foliage color.

3. Certified Seed (blue tag)

   Certified seed is harvested from trees or shrubs proven to be genetically superior by field testing their progeny. The potential for genetic improvement of seed is highest for this category of certification. Normally seed in the Certified category would be produced in seed orchards. All of the trees in the seed orchard would be of proven genetic quality.

Field Inspection

For Certified and Selected seed, an initial field inspection is made prior to pollination. At this inspection compliance with regard to roguing and isolation as covered by State Seed Department standards is checked. The inspector will require additional roguing if any trees or shrubs fail to meet the standards.

For Certified and Selected seed, a second inspection is made within 90 days prior to seed collection. At this inspection particular attention is paid to the size of the crop and for evidence of disease and insects.

No field inspection is required for Source - identified seed.

Field inspections are the responsibility of the State Seed Department, but in view of their lack of necessary technical expertise in forestry related matters, they have asked the Tree Improvement Subcommittee to assume the responsibility for field inspections.

Seed Testing

The State Seed Lab is responsible for testing samples of each seed lot that is submitted for certification. Common tests are purity

percent, percent full seed, and germination percent. Since they have had little experience with tree seed, they have enlisted the assistance of the USDA - Forest Service Eastern Tree Seed Laboratory in developing reliable testing procedures.

Present Status of Program

Promotional Activities

Although North Dakota's tree and shrub certification program is less than two years old, progress is already being made. As a means of promoting the certification of seed by seed collectors and nurserymen a training session and inspection tour was held in August, 1974. A variety of trees and shrubs in federal, state, and private ownership were inspected and recommendations were made regarding their suitability for certification. Considerable material was identified as appropriate for certification. Considerable material was identified as appropriate for certification as Source - Identified. Owners were encouraged to submit seed from these sources as soon as possible. In several instances, trees or shrubs exhibiting superior characteristics were identified as candidates for the Select class of certification. Suggestions regarding roguing procedures were made and the owners were urged to submit the material for certification.

Many of the individuals involved in the training session expressed their surprise at the amount of material already in existence that would qualify for certification.

Activities in Other States

Other states in the Great Plains and central United States are becoming interested in starting certification programs of their own. Kansas has begun preliminary work and Nebraska will likely follow suit in the near future. As a means of coordinating the development of these programs, the Central States Tree Improvement Committee has formed a seed certification subcommittee. The function of this subcommittee will be the promotion of uniform certification standards among the member states of the Central States Tree Improvement Committee.

Internationally, uniform certification standards are being promoted by the Organization for Economic Cooperation and Development (O.E.C.D.), a United Nations sponsored organization. The O.E.C.D. scheme is designed to cover all reproductive material - seeds, plant parts, and plants. The categories or reproductive material are as follows:

1. Source - Identified Reproductive Material (yellow tag).
2. Selected Reproductive Material (green tag).
3. Untested Seed Orchard Reproductive Material (pink tag).
4. Tested Reproductive Material (blue tag).

The addition of category 3 provides for the differentiation of selected, but untested material into two categories, differing in the level of potential genetic improvement expected. Under the old scheme, with only three certification categories, both seed production areas and untested seed orchards would be lumped under the Selected Category. The potential for genetic gain is likely to be much greater for the seed orchard than for the seed production areas. Under the new scheme the seed production area would still be certified as Selected, but the seed orchard would qualify for Category 3 - Untested Seed Orchard Reproductive Material.

Since the programs in the Dakota's were developed prior to the new O.E.C.D. scheme, it will be necessary to revise their categories to conform to the new scheme.

Now I would like to conclude my presentation on seed certification with a few slides that illustrate some of the certification categories and the work being initiated in the Dakota's.

ANNUAL REPORT OF COOPERATIVE REGIONAL PROJECTS

January 1 to December 31, 1974

1. PROJECT: GP-13 Improved Juniper for the Great Plains.

2. COOPERATING AGENCIES AND PRINCIPAL LEADERS:

State	Agency	Leader
North Dakota	USDA - Forest Service	James L. Van Deusen
	N. D. Experiment Station	Robert Heintz
South Dakota	Dept. of Game, Fish and Parks, Div. of Forestry	James Suedkamp
	S. D. Experiment Station	Paul E. Collins
Nebraska	USDA - Soil Conservation Service	Ashley A. Thornburg
	USDA - Forest Service	Ralph A. Read
	Nebraska Experiment Station	Walter Bagley
Kansas	USDA - ARS	Jerry Dickerson
	Kansas Experiment Station	Gary Naughton
Oklahoma	Oklahoma Experiment Station	Clark W. Lantz
Texas	Texas Experiment Station	William Lowe
	Texas Forest Service	Robert Fewin
New Mexico	USDA - Forest Service	Jack Pitcher
Colorado	Colo. Experiment Station	Gilbert H. Fechner
	Colo. Forest Service	Marvin D. Strachan
	USDA - Forest Service	Richard A. Cunningham
Wyoming	Wyoming Experiment Station	Charles McAnelly
Montana	Montana Experiment Station	Orville McCarver
	USDA - Forest Service	George Howe
	Dept. of Natural Resources and Conservation	Willis Heron

3. PROGRESS OF THE WORK AND PRINCIPAL ACCOMPLISHMENTS:

The principal objective of this regional project is to identify the best adapted sources of eastern red cedar and Rocky Mountain juniper for planting over a very wide and diverse range of environmental and topographic conditions within the Great Plains region.

Since the last annual report, a work plan has been prepared and approved by the technical committee members describing in considerable detail the specific activities to be carried out by cooperating agencies. Plans are to select about 300 above average eastern red cedar and Rocky Mountain juniper trees in natural or planted stands throughout the Great Plains. Seed will be collected from these trees and used to produce planting stock for test plantations in eight or more locations from North Dakota to Texas. Cooperators will maintain the test plantation and collect performance data periodically to permit evaluation of seed source performance.

Approximately one-half of the desired seed collections have been made and it is anticipated that by the winter of 1975-76, nearly all collections will be complete.

Another objective of the project is to develop a provisional seed zoning system for trees and shrubs being planted in the Great Plains. Such a system has been devised by Dr. Richard A. Cunningham and others of the Technical Committee. A manuscript describing the system has been prepared and approved by the committee members. Publication in 1975 is anticipated.

L. USEFULNESS OF FINDINGS:

The results expected from this regional project will have immediate value in the planning and implementation of tree planting programs. Survival and performance information obtained from initial outplantings of different species of juniper and their ecotypes will provide local and region-wide information about those most suitable for use. The test plantations will also provide pools of material for taxonomic and physiologic study and as well as a variety of individuals for selection and subsequent propagation and breeding.

5. WORK PLANNED FOR NEXT YEAR:

During calendar year 1975, plans are to complete all of the seed collections and to prepare the seed lots for sowing and planting stock production. Selection of outplanting sites will be finalized and plans for site preparation will be made.

6. PUBLICATIONS ISSUED FOR MANUSCRIPTS PREPARED DURING THE EAR:

Manuscript prepared - Cunningham, R. A. "Provisional Tree and Shrub Seed Zones for the Great Plains." To be jointly published by the Rocky

Mountain Forest and Range Experiment Station, Fort Collins, Colorado and the USDA - Forest Service, Rocky Mountain Region, Denver, Colorado. It is sponsored by the Great Plains Agricultural Council.

7. APPROVED:

July 18, 1975
Date

Richard A. Cunningham
Chairman, GP-13 Technical Committee

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Date

Vacant
Administrative Advisor, GP-13 Technical Committee