

Nursery Research: A Practical Approach¹

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Abstract.--A summary is given of research activities being carried out at the PFRA Tree Nursery, Indian Head, Saskatchewan. Main areas of investigation include propagation, tree improvement, weed control, soils, entomology and pathology.

INTRODUCTION

The PFRA Tree Nursery has produced and distributed over 450 million seedlings since its establishment in 1902. The mandate of the Nursery remains much the same today as when it started, that is, to provide trees for shelter to farmers in the Canadian prairie provinces. Currently, approximately 25 species are produced, comprised of both coniferous and deciduous stock. Almost half of our yearly production is one specie, namely caragana (*Caragana arborescens*). The trees are used as farmstead shelterbelts for protection of yards, as field shelterbelts for soil erosion control and snow management, and as roadside belts for snow control.

Almost 40 years ago, the Nursery established a research component responsible for conducting studies on tree breeding, physiology and pest control. Since that time the research section has undergone a number of changes. Today this section is composed of five units, namely, Propagation, Soils, Herbicides, Entomology and Shelterbelt Studies. There are a total of eight full time and six seasonal or casual personnel in the section. This represents about 16 percent of the total allotment for the Nursery. The mandate of the group is to solve the problems associated with growing trees on the prairies and to determine the effects of these trees on prairie agriculture. Each year numerous practical studies are completed and reported in our Annual Report. Recommendations are implemented by our Production and Extension Sections.

Along with the research mandate, the Investigation Section is also responsible for overseeing most technical operations on the Nursery.

For example, herbicide, insecticide and fungicide applications are supervised and/or conducted by Investigation personnel. Implementation of test results therefore, becomes fairly straightforward.

Examples of areas of research being conducted by each of the five units in the Investigation Section follow:

Propagation

Bill Schroeder is in charge of both the Propagation and Soils Units. Our Propagation technician is Dan Walker. The Propagation Unit is the largest group, with the greatest diversity of studies. Examples of trials conducted in 1985 include such things as dates, rates and depth of sowing seed, effects of mycorrhizae, root wrenching treatments, fall vs spring sowing, propagation techniques for poplar cuttings, evaluation of seedling maturity, ethylene adsorbant for seedling storage, freezer storage techniques, green ash provenance trials, USSR pine breeding trial, USSR Siberian larch provenance trial, and packing material tests. Other areas of interest include seed storage, seed stratification, chemical fruit drop, chemical defoliation, container culture technique and others. For details on these and many other related topics, refer to our Annual Report.

Soils

The Soils Unit is responsible for providing service support to the Production Section by conducting soil analysis of all fields. Our Soils technician is John Cruickshank. Recommendations are provided on the basis of fertility trials conducted at the Nursery. Irrigation scheduling has also been reviewed with hopes of implementing a more precise system.

Herbicides

Bruce Neill is in charge of both the Herbicide and Entomology Units. Our Herbicide technician is

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Lyle Alspach. Current studies include screening herbicides for pre-emergence weed control in sowings of Colorado spruce, Scots pine, white spruce, honeysuckle, green ash and caragana, and in poplar and willow hardwood cuttings. Post-emergence weed control in villosa lilac and caragana is also being pursued. Herbicides for use in newly planted and established shelterbelts are continually being screened. The Nursery now has herbicide recommendations for over 70 percent of our annual production and has one to four people involved in herbicide applications throughout the growing season.

Entomology

Don Reynard is the technician working in the Entomology-Pathology Unit. Studies dealing with pesticide efficacy, life history, pheromones and fungicide efficacy are conducted yearly. Currently, much work is being done on pheromones for monitoring and control of the cottonwood crown borer (Sesia tibialis), and the spring cankerworm (Paleacrita vernata). Insecticide trials are conducted on pests as they arise. In 1985, insecticides were tested for control of the cottonwood crown borer, spruce budworm (Charistoneura fumiferana), blister beetles (Lytta spp.) and the willow shoot sawfly (Janus abbreviates). Fungicide trials are conducted for control of storage molds, and poplar cuttings

diseases. The Saskatchewan Dutch Elm Disease survey is also supervised by the Entomology Unit.

Shelterbelt Studies

John Kort heads this new unit which started in 1984. Studies will be conducted to support our Extension Section, who are responsible for promoting the use of shelterbelts on the prairies. Effect of shelterbelts on microclimate, crop yields, snow distribution and other effects will be of major concern. Potatoes, canola, safflower and wheat are currently being evaluated for their response to shelter. Various shelterbelt species and designs are also being tested for their potential in a soil conservation system.

CONCLUSION

P11 studies conducted at the Nursery have a practical origin. Through the last 40 years we have been able to build up a technical support staff for our Production and Extension Sections. Although our trials are aimed at solving our own problems, results often apply to other nurserymen. We encourage others to tour our operation and to call on us for advice. Yearly summaries of all studies can be found in our Annual Report which can be obtained by writing the author.