CFS CANADIAN FOREST SERVICE
cfs.nrcan.gc.ca

Branching out

from the Canadian Forest Service ▪ Laurentian Forestry Centre

Number 32
2006

Genetic gains demonstration network: ten years and growing

More than 100 million trees have been planted in Quebec for reforestation[1]. In 1996, a network of plantations was established to demonstrate the gains in growth and quality of genetically improved seed sources that were recommended over local or poor quality seed sources for reforesting.

Seven demonstration plantations containing seedlings[2] of different origins were established across the province, mainly in teaching and research forests. Researchers from both the Canadian Forest Service and the Tree Breeding Service of the *ministère des Ressources naturelles et de la Faune du Québec* (Quebec Department of Natural Resources and Wildlife) provided scientific supervision for the project.

White spruces (Mont-Laurier).
Photo: René Pâquet (SCF)

Over the past 10 years, growth and vitality measurements for all of the species tested have been collected and recorded on the Demonstration network Web site, where it is possible to check whether the anticipated outcomes for the various species are being achieved. White spruce is a particularly interesting species, given that it is the second most popular species for reforestation in Quebec and that it has shown a great potential for genetic improvement. It is popular due to its high survival rate after planting, its high yield, its great versatility and the characteristics that make its wood desirable in the industry. For example, the results gathered at the Mont-Laurier plantation demonstrate that the real gains correspond to the expected gains, with a few variations.

1 Ministère des Ressources naturelles et de la Faune du Québec. Ressources et industries forestières. Portrait statistique. December 2005
2 White spruce, black spruce, Norway spruce, white pine, jack pine and hybrid larch.

Natural Resources Canada Ressources naturelles Canada

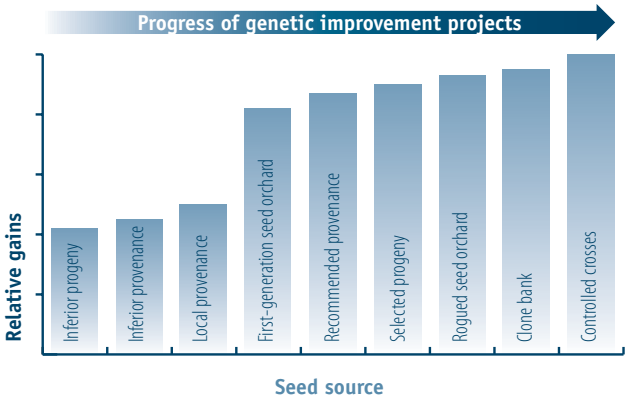
Canada

Superior seeds therefore perform better than local seeds. However, some seedlots, such as the selected progeny 3 (see graph), behaved unpredictably and did not deliver the expected yield for this site quality.

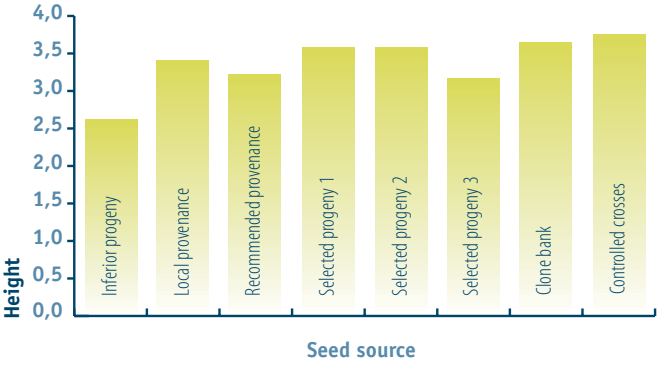
White spruce: potential for growth

The expected volume gains in white spruce plantations planted in the first phase of the improvement plan are of approximately 20% compared with plantations grown from seeds collected from natural stands. The second generation will produce an additional gain of 15%.

Expected gains according to seed source



White spruce gains measured after 10 years, Mont-Laurier plantation



Genetic improvement of trees is the basis for reforestation programs for the main commercial species. It plays a vital role in maintaining and improving our ability to produce quality wood products. The Demonstration network has shown the substantial growth potential of genetically superior sources and continues to serve as a regional window for promotion.

USEFUL LINK :

Genetic gains demonstration network
http://demonstration.cfl.scf.rncan.gc.ca/accueil_e.html

Mimicking the natural selection process

Genetic improvement of trees is achieved by selectively reproducing individual specimens whose characteristics produce quality seedlings. In Quebec, this is done using traditional plant domestication methods and not genetic engineering, which produces genetically modified (GM) trees. Genetic improvement is achieved through a continuous cycle of selection, testing and cross-breeding.

FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

Jean Beaulieu or **Gaëtan Daoust**
Natural Resources Canada
Canadian Forest Service
Laurentian Forestry Centre
1055 du P.E.P.S
P.O. Box 10380, Stn. Sainte-Foy
Québec, Quebec G1V 4C7
Phone: 418-648-5823 (J. Beaulieu)
418-648-7616 (G. Daoust)
Fax: 418-648-5849
E-mail: jean.beaulieu2@nrcan.gc.ca
gaetan.daoust@nrcan.gc.ca
Web site: www.cfl.scf.rncan.gc.ca

PARTENARIAT INNOVATION FORÊT

© Her Majesty the Queen in Right of Canada 2007 • Catalog Number Fo113-1/32-2007E • ISBN 978-0-662-45069-6 • ISSN 1705-5784