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Arborea II: Genomics for Molecular Breeding in Softwood trees Discovery of Gene Markers to Enhance the Productivity and Value of Spruce through Integrated Functional Genomics and Association Mapping

Status	Current
Competition	III
Sector	Forestry
Genome Centres	Genome Quebec & Genome Alberta
Project Leaders	John MacKay & Jean Bousquet

Project Description

Spruce trees are the most widely used species in Canada's forest plantations. Breeding new generations of spruce trees can be a slow process, however. That's why Canadian forest genomics researchers are studying tree growth and yield as well as wood properties, at the molecular level. Genomics can be used to improve the productivity and competitiveness of Canada's forest products industry, which accounts for \$81.8 billion of activity annually and provides more than 375,000 direct jobs.

Drs. John MacKay and Jean Bousquet, forest biologists at Laval University are project leaders of Arborea II: Genomics for molecular breeding in softwood trees.

Arborea II will create an inventory of the natural variability and expression of thousands of spruce genes. By identifying specific genes associated with growth and wood quality, the project will develop tools and protocols making it possible to select well adapted high-performance spruce trees with better-quality woods. This in turn will promote the competitiveness of the Canadian forest industry. Breeding cycles can take more than 20 years with spruce trees. Anticipated project results will help to shorten the time it takes to select and breed trees with desired traits, increasing the commercial value of spruce trees for saw logs and for pulpwood.

Arborea II will draw on the research strengths of the Canadian Forest Service and national and international collaborators, in order to integrate research, technology transfer, economic analyses and studies of the environmental acceptability of molecular breeding of spruce trees. Interacting with provincial research organizations and the forest products industry, the project team will generate new knowledge on a valued multi-purpose tree species, offering social, environmental and economic benefits.