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Canadian Wood Fibre Centre



Boosting plantation performance for a globally competitive fibre supply

The Canadian Wood Fibre Centre (CWFC) and a broad base of provincial, academic and industry partners are helping apply advanced technologies to increase plantation growth rates while optimizing wood quality, pest resistance and adaptability to climate change.

Need

Many countries can grow timber more rapidly than Canada because of their favourable climate. Canada can compete globally by producing superior quality wood fibre in economically significant volumes – and at the fastest rates possible given our growing conditions.

Annually, 640 million trees are planted in Canada. Innovative methods are needed to maximize the productivity and quality of these plantations for a competitive wood supply. Rapid growth of desired fibre attributes is important. But equally important are trees of consistent size and quality with resistance to pests and adaptability to a changing climate.

Approach

Long-established tree breeding programs throughout Canada aim to produce genetically improved seedlings to maximize the productivity and quality of forest plantations. The CWFC and its research partners have developed an advanced approach called multi-varietal forestry (MVF) to boost the gains of conventional tree breeding techniques.

By using advanced technologies for mass propagation and cryo-preservation, MVF increases productivity, quality and volume gain in forest plantations. Testing shows that it is the only tool that increases wood production without compromising commercially important wood properties such as density.

MVF is implemented through a broad-based consortium of provincial governments, academic institutions and the forest industry, which collectively support the National Network of Somatic Embryogenesis Laboratories.

Benefits

MVF provides a new level of knowledge about tree quality to enable plantation forest managers to carefully deploy the right planting stock to the right sites for optimal plantation performance. Managers can confidently forecast plantation output, plan wood supply for particular end-products, and conduct realistic financial analyses to evaluate silvicultural investments over time.


Research with white spruce on prime growing sites in New Brunswick shows that MVF increases volume gain by 20 to 50 percent over conventional seed orchard output. Carried forward, this gain would reduce time to harvest to 35 years from the usual 45-year rotation. And managers can anticipate trees of predictable size and quality to reduce sorting and transportation costs.

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Working together to optimize wood fibre value – creating forest sector solutions with **FPInnovations**



Canada



“J.D. Irving, Limited has strongly supported the CWFC Multi-Varietal Forestry / Somatic Embryogenesis Project conducted by Dr. Yill Sung Park et al. We have worked collaboratively with Dr. Park for many years and see strong benefits of MVF on part of our forest landscape. Increased growth rates, tree quality and insect resistance based on the broad genetic variation in our tree populations can be efficiently propagated through somatic embryo genesis. This will have a positive impact on sustainable harvest levels, while at the same time allowing for management for the broad range of ecological and societal values at the forest landscape level.”

*Greg Adams, Manager
R&D, Nurseries and Tree Improvement
J.D. Irving, Limited*

Competition and challenges

Tree breeding programs form the critical basis for the application of MVF. Thus, the technology is an enhancement that enables industry to more rapidly realize gains from longstanding investments in tree improvement. This unique approach is successful when genetically improved stock is carefully matched to sites and plantations and grown with the appropriate care.

Along with other technologies that optimize the forest value chain, MVF offers managers an advanced tool for the production of superior quality wood fibre in economically competitive volumes and time scales. As with all innovation, there is up-front cost to implementation that should be evaluated against future profitability. And research and development is the underpinning that MVF needs to continue to develop the technology for all commercially important forest species.

Continued technology development will refine MVF as a tool for value-oriented forest management planning. Mechanized production systems that link laboratories, greenhouses and nurseries will help reduce the operational costs. Increased research and application throughout the innovation system will improve the understanding and acceptance of this intensive forestry practice in Canada and internationally, thereby favouring increased adoption.