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Branching out

from the Canadian Forest Service
Laurentian Forestry Centre

SOMATIC EMBRYOGENESIS: A CONIFER REPRODUCTION METHOD

***In vitro*[1] culture has the potential to play a considerable role in tree improvement programs. Its chief advantage is the ability to multiply plants in very large quantities and to make improved or selected specimens available for use in a shorter time than by conventional means.**

Somatic embryogenesis is a method of *in vitro* plant cloning that results in the production, from a single seed, of a multitude of somatic embryos (clones) that grow into genetically identical trees. The term "somatic" means that the embryos are created asexually.

Canadian Forest Service – Laurentian Forestry Centre researchers are actively working to develop complete somatic embryogenesis protocols (recipes) for a few pine species (eastern white pine, western white pine, jack pine). The research on pines should make it possible to produce selected strains of pine quickly and to accelerate the development of varieties with increased resistance to certain significant diseases, such as white pine blister rust.

1. Initiation of embryogenetic tissue • 2. Mature somatic embryos • 3. Somatic seedlings • 4. Seedlings growing in containers
Photos: K. Klimaszewska

Clones of selected trees must be tested in the field for several years before some of them can be selected for mass production. Therefore, there is a need for storage of embryos during the lengthy field tests. One aspect of this research is the development of a long-term liquid nitrogen storage method (cryopreservation). This method allows us to store embryos in a minimum of space and reproduce them in large quantity when required.

Somatic embryogenesis makes it possible to obtain seedlings in sufficient numbers to be used in the field faster than with traditional breeding programs. That is how the millennium trees were produced: more than one million white spruce seedlings stemming from a few seeds were distributed across Canada during the year 2000.

USEFUL LINK

Biotechnology
www.nrcan-rncan.gc.ca/cfs-scf/science/resrch/biotechnology_e.html

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1 *In vitro*: Refers to any biological research or experiment done outside the organism (in test tubes, Petri dishes and other culture vessels).

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