



## Canadian Forest Service

# Atlantic Forestry Centre – Making a Difference

**Impact Note No. 45**

## National Tree Seed Centre

Natural Resources Canada's National Tree Seed Centre (NTSC) provides seed for research and preserves the genetic diversity of trees and shrubs in Canada. It has the largest collection of seed from Canadian tree and shrub species.

The NTSC's focus is to obtain, store and provide native Canadian tree and shrub seed of known origin for research. The NTSC also has a gene conservation collection to preserve Canada's native tree and shrub species, in which small samples of seed are stored indefinitely.

It is important to conserve the genetic variation within these species because it can be used to mitigate the impact of future threats from climate change, invasive alien pests or other environmental stresses.

For example, in 2004, in response to the threat posed by the emerald ash borer, the NTSC started a program to collect and store ash seed to conserve the genetic variation of ash species. To date, around 1,600 unique collections have been made and the work continues. Ongoing research focusses on assessing long-term seed storage ability, refining processing techniques and developing testing protocols for germination.

### Location

The NTSC was established in 1967 and is located at the Canadian Forest Service – Atlantic Forestry Centre (CFS-AFC) in Fredericton, New Brunswick. The NTSC has about 16,500 seedlots from 130 Canadian tree and shrub species. Its goal is to obtain representative samples of all Canada's tree and shrub species from across their natural ranges.

### Seed Collection and Testing

Seed is collected only from natural stands during good seed years (except for special species-specific collections for research projects). A representative genetic sample with high physiological quality is ensured when seed is collected from a variety of average



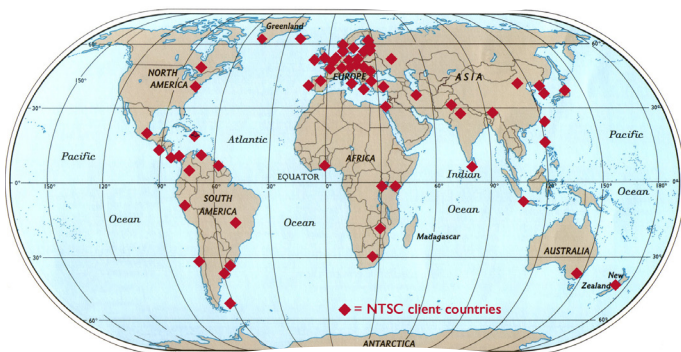


quality trees. NTSC staff collect most of the seed but some seed is obtained by exchange, purchase or donation or in collaboration with other CFS centres, National and Provincial parks, provincial forest services, First Nation's initiatives and other forest agencies.

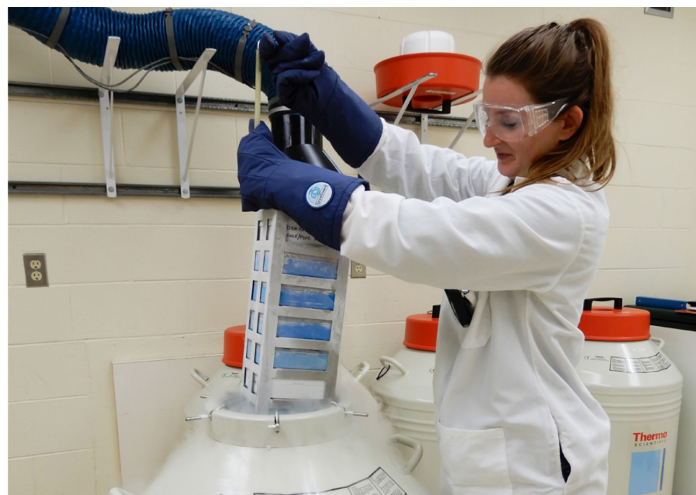
Prior to storage, moisture content is determined. Target moisture content of seed that can be frozen is between 5%–7%. Thousand seed weight is determined and seedlots are tested for germination. The NTSC uses standard procedures that follow the International Seed Testing Association or the Association of Official Seed Analysts rules. A database is maintained to track and retrieve precise information on individual seedlots.

## Seed Storage

Seed from most species can be preserved for many decades when it is dried and stored at low temperatures ( $-20^{\circ}\text{C}$ ) in specialized freezers. However, some hardwood species, such as oak, silver maple and butternut do not store well. The NTSC has a cryogenic facility where seed or tissue is stored in liquid nitrogen ( $-196^{\circ}\text{C}$ ). Embryos from butternut seed (an endangered species) are stored under these conditions.



NTSC seed has been shipped to clients in 68 countries.



Liquid nitrogen tank used to store genetic material.

## Who Can Use the Seed?

Seed is provided for research use only and can be obtained at no charge upon request. Seed has been used for a variety of projects, including germination and physiology studies, DNA and isozyme studies, climate change and assisted migration studies, reclamation and restoration projects, and provenance trials. The NTSC has shipped seed to 68 countries and is recognized globally as a seed supplier for research purposes.

NTSC staff are always interested in collaborating with researchers, universities, government agencies and non-government agencies to locate additional sources of seed and participate in seed research projects.

### For more information, contact:

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