



Inspections of lodgepole pine seed.

CONE AND SEED IMPROVEMENT

This program conducts applied and basic research on tree seed throughout the entire seed handling system, constructs and summarizes quality assurance programs and performs education, extension and formal and informal communication activities. Activities in this area play a key role in addressing issues of importance to conifer seed science and technology and genetic conservation.

ADMINISTRATIVE OPERATIONS

These business areas include Finance and Administration, and Facilities and Site Operations. Finance and Administration staff play a key role in supporting office, staff and expenditure/revenue budget management. Facilities and Site Operations is dedicated to managing and protecting all site, building and equipment assets.



Finance and Administration staff at the Tree Seed Centre.

For more information about the TSC program, services provided and who to contact, please visit our website at <http://www.for.gov.bc.ca/hti/treeseedcentre/>.



BC FOREST SERVICE Tree Seed Centre

EXCELLENCE IN CONE & SEED SERVICES



Ministry of
Forests and Range

MINISTRY OF FORESTS AND RANGE

The Tree Seed Centre (TSC), as part of the BC Ministry of Forests and Range, Forest Stewardship Division, Tree Improvement Branch, is located in south Surrey, BC. A little over 50 years ago, the British Columbia Forest Service began operating a provincial seed centre in Duncan on Vancouver Island. By the late 1970s, operations at the Duncan location were significantly constrained as a result of infrastructure age, size, production capabilities, capacity to handle various species and seedlot sizes, and physical proximity to clients or service providers. In the mid-1980s design and construction of a new facility specifically designed for the delivery of cone and seed services was completed. In 1986, operations were closed in Duncan and resumed in Surrey.

The TSC is located on 6.7 hectares of land. The facilities measure 3 623 square metres and are comprised of offices, cone conditioning areas, cone and seed processing and distribution areas, a dedicated seed laboratory, coolers and long-term storage vaults. The facility is supported by a system of daily checks and inspections, backup power generators and security systems. The TSC has been designated Mission Critical within the Ministry's overall business continuation plan.



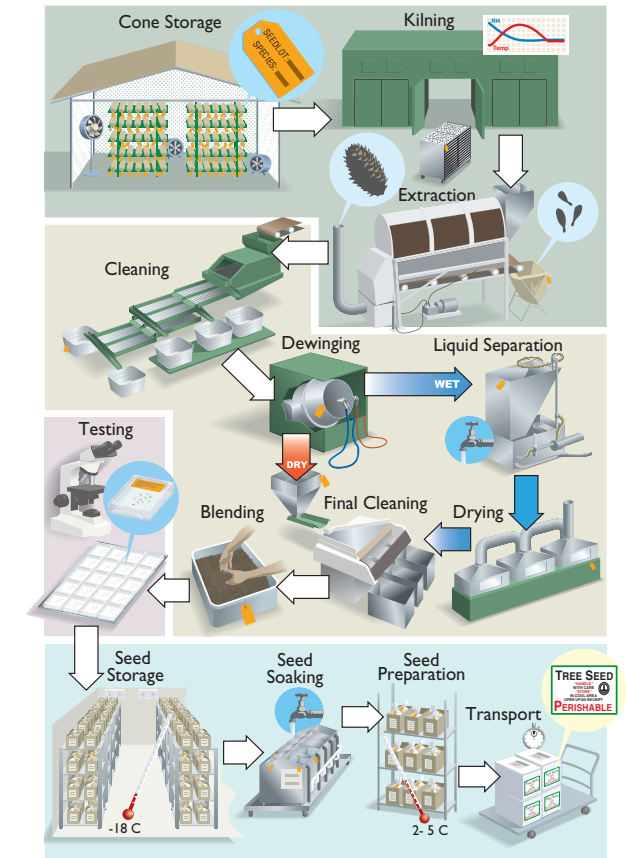
Tree Seed Centre staff

Tree Seed Centre staff include 14 full-time and six to eight part-time employees, supplemented by a variety of professional, technical and trades contractors. Staff perform a variety of highly specialized functions and collectively represent over 300 years of TSC experience.

Services are provided to a large and diverse group of clients including forest licensees, Ministry of Forests and Range, seed orchards, forest nurseries, tree seed dealers, First Nations, researchers, educators and the public.

EXCELLENCE IN CONE & SEED SERVICES

For many years, the TSC mission has been "Excellence in Cone and Seed Services." The variety of services provided by the TSC, often referred to as the Seed Handling System, forms a chain of custody and is an integral link in a complex gene resource management system that continues into our future forests. Seedlot diversity, identity and quality must be ensured, maintained and carefully tracked during and after a seedlot's active life. Best scientific and technical information guide and inform decision making and continuous improvement. The TSC's Quality Assurance (QA) Program evaluates and monitors current practices and products to assist with our continuous improvement philosophy. Quality Assurance program activities include observations, measurements, seedlot/request identification, process control, testing and a variety of measurements. A wide range of quality assured stewardship services are provided in the diagram below:

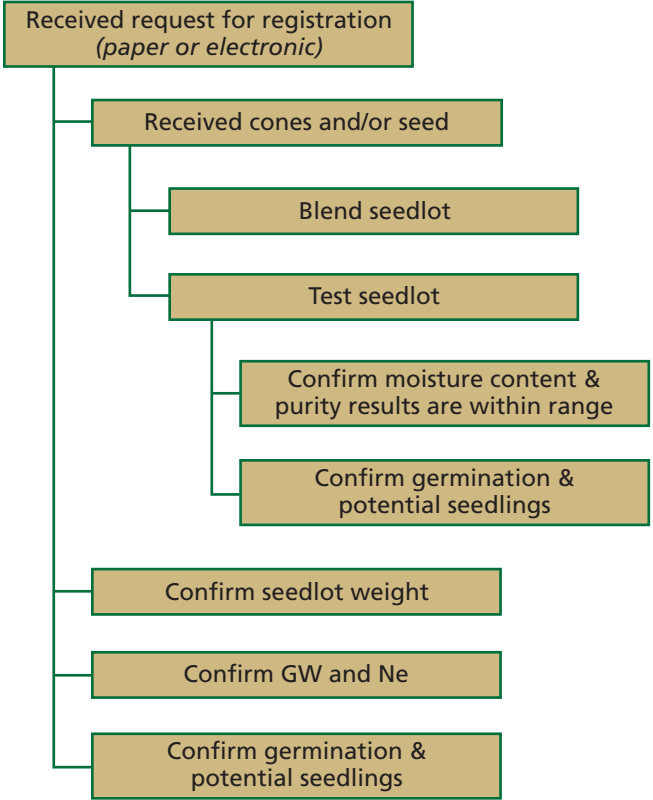


Seed Handling System

REGISTRATION

The TSC registers all tree seed destined for Crown land reforestation. As part of this process, the TSC ensures that seedlots meet applicable collection criteria specified in the *Chief Forester’s Standards for Seed Use* (<http://www.for.gov.bc.ca/code/cfstandards/>). The standards include minimum requirements for genetic diversity and physical quality for seedlots. Collection origin information is also used to guide transferability of seedlots to ensure adaptability of our future forests. Registration information and data integrity is maintained in a web-based Seed Planning and Registry System (SPAR). This system also allows clients to apply for registration online and to view up-to-date testing, ownership, history of use and seed or seedling equivalent availability information for registered seedlots. The Registry is comprised of 5 952 active seedlots and 6 113 seedlots for which seed is no longer available.

Seedlot Registration Process



INFORMATION MANAGEMENT

The TSC utilizes a two-level information management system. The corporate Seed Planning and Registry (SPAR) web-based system captures seedlot and service request data. It is used by both the Ministry of Forests and Range, and industry clients. The local Cone and Seed Processing system (CONSEP) captures significant volumes of detailed data, and receives and sends high-level and summary data to SPAR. These systems work together to capture seedlot and request data, to schedule and report outcomes and to support “just-in-time” service delivery and decision management. Systems also support financial and administrative operations and play a key role in continuous improvement and knowledge management.



Tree Seed Centre staff using the SPAR program.

SEED STORAGE

The TSC is responsible for storage and maintenance of seed under optimum conditions (4.0 to 9.9% moisture content at -18°C). On average, each year 4 000 kilograms, the equivalent of 459 million potential trees, were added and 2 700 kilograms are withdrawn from long-term seed storage. The seed inventory also has an important risk management role in the event of catastrophic losses resulting from wildfire, insects, disease and climate change, and includes a dedicated seed bank for genetic conservation purposes. Inventory management activities include: additions of new and returned seedlots; withdrawals for reforestation, research, education and public relations; seed and seedlot quality and quantity assurance checks; and management of information related to seed availability, ownership, sales/transfers and history of use. Clients generally request that withdrawn seed is forwarded with treatment, (i.e., pelleted in the case of western redcedar and



Seed withdrawal from long-term storage.

alder, or stratified for other species using standard or custom methods).

SEED TESTING

Standard tests are performed on new and stored seedlots and include moisture content, purity, seed weight and germination capacity. Seed per gram and germination rate are derived from principle test results. As well, an x-ray of all new seedlots is taken. Work in this area is in accordance with International Seed Testing Association (ISTA) and Association of Official Seed Analysts (AOSA) rules, Ministry of Forests and Range seedlot registration policy and/or TSC standards.

Quality Assurance tests are performed on a portion of a seedlot, a specific point in processing, or on a specific request. Test types, sampling methods, sample sizes, and size and number of replications may vary between QA and Standard test types. Seedlots and requests may also be subject to fungal assay testing. Work in the testing business area also supports research.

Thousands of test transactions are performed each year at the TSC as a means to confirm seed quality at a given point in time, to help guide and inform cone and seed



treatment, process control, monitoring and continuous improvement.

Seed samples (top left to right): spruce, lodgepole pine, Douglas-fir and western redcedar.

CONE & SEED PROCESSING

This business area includes cone and seed evaluations, conditioning of cones, extraction of seed from cones and the removal of debris and non-viable seed. Cone and seed evaluation services prior to and during collection and interim storage are provided to cone and seed processing clients. Other services include registering returned seed and seedlot upgrading, research trials and small lot processing. As a result of mountain pine beetle concerns and increasing orchard production, cone



Gravity table being used as part of cone and seed processing.

and seed processing volumes are three times that of the past 10-year average. Currently, the TSC is processing about 10 000 hectolitres each year. In order to meet these increasing production levels, cone and seed processing operations run continuously throughout the year, at times on a more than one-shift basis. Staff at the TSC are also seeing an increase in requests for expedited processing and service complexity, particularly for those production, family and research lots originating from seed orchards.



Cone and seed processing.