

Christchurch City Council Nursery Seed Collection and Processing[©]

Joe Cartman

Christchurch City Council, Po Box 237, Christchurch 8140, New Zealand

Email: Joe.Cartman@ccc.govt.nz

INTRODUCTION

The Christchurch City Council (CCC) nursery collects seed for its revegetation projects from the various reserves that the city administers. The main collection sites are the Avon - Heathcote estuary, Travis Wetland, Brooklands Lagoon, and the Port Hills.

We try to collect from wild, natural stands in preference to cultivated plants. This is a deliberate attempt to try to increase the population of known local origin plants.

We avoid collecting from parks and gardens within the suburbs as few of the established native plants in suburban parks are known to be of local origin. It is also difficult to identify any local origin plants that may be present. Any that are present are also readily able to cross with the same species of unknown origin in the park or in nearby gardens. *Pittosporum*, *Cordyline*, *Phormium*, and anything with separate male and female plants must outcross with another individual to produce seed.

The estuary and Brooklands Lagoon provide seed mainly from a range of reeds and rushes such as *Apodasmia similis*, *Ficinia nodosa* (syn. *Isolepis nodosa*), *Carex littorosa*, *C. virgata*, and also the shrubby *Plagianthus divaricatus* and *Leptospermum*.

The Port Hills are the main source for shrubby species and trees as little natural woody vegetation remains in the city outside Riccarton Bush.

SEED COLLECTION

Seed collection starts in January and finishes in May or sometimes in June if it is a late season. The nursery collects 50 to 60 species of mainly native plants and a few exotic trees. We have monthly collection lists based on past collection dates for our area.

If any given native plant species has a widespread distribution which includes the local Christchurch area we endeavour to grow from the local source even if it is just for suburban park planting. This ensures the plants are climatically fit for the area.

Seed is also collected from a number of different individuals in a population to ensure as wide a genetic spread as possible.

Seed is collected by various means but the first priority is to ensure that what is collected is good seed. *Spinifex* is an example where the male and female inflorescences look quite different. The male looks like a typical grass seed head, the female seed head is an extraordinary structure consisting of a ball of stiff bristles 20 cm or more across. Both are still present in a population at the time the female seed heads are ripe. I have seen an example where the male heads were collected by mistake.

Capsules and fruit are checked to ensure that they have seed in them; a sample is cut open to see if the seeds are full. A $\times 10$ hand lens is useful for smaller seeds.

Seed can be hand picked which can be laborious and time consuming especially with individual seed heads or fruit.

Tussock seed heads are gathered up in a bunch and cut off, collecting numerous seed heads at a time. The wild tussocks almost always have other grass species growing in with them and it is vital that these unwanted seed heads are removed immediately before they dry out and drop their seeds and contaminate the collected species. Grasses can be difficult to tell apart at the pricking out stage and having to discard pots of unwanted exotic species later is an expensive exercise.

For the larger trees, especially the native conifers such as totara (*Podocarpus totara*) and matai (*Prumnopitys taxifolia*) we hang shade cloth horizontally below the tree canopy to catch falling fruit. The cloth is tied to neighbouring shrubs with ropes. We check carefully to ensure any given tree is female and as we have several marked female trees we need to ensure they are producing seed that year. This method is also dependant on the tree being in an area remote from the public so the nets are not interfered with. The nets

may have to hang in place for several weeks. Place a rock or branch in the net to stop it flapping in the wind and flicking the seed out.

Another useful method for some shrubs with fruit, mainly divaricating *Coprosma* spp., is to place a sheet on the ground below the shrub and “rummage” the shrub to dislodge the fruit. This results in a sheet full of fruit, leaves, insects and the occasional lizard.

Sophora and *Myoporum* are raked up under the trees and sieved out. The seeds are around 5 mm in diameter and large enough to easily sieve out from other debris.

Sophora seed pods are also collected off the trees.

The often repeated advice to collect seed into paper bags tends to be repeated parrot fashion, probably by people who have never collected seed in wet weather. Wet seed heads and fruit cause paper bags to come apart at the seams and disintegrate. We always collect into plastic bags for this reason.

SEED PROCESSING

Collected seed is then processed by various methods.

Species with dry capsules that open readily, such as *Juncus* spp. are placed in a tray or a paper bag to dry for a time until the seed drops out. The seed is then cleaned of any unwanted debris. Care needs to be taken to ensure *Juncus* seed is not mistaken for dust and discarded as it is very fine.

Dry seeds that don't open such as *Carex* spp., have to be broken up to release the seed, this is done by rubbing the seed heads through a sieve.

Sophora pods are soaked in water for 24 h to soften the tough pods, they are then rubbed through a 10-mm sieve and the resulting seed and debris from the broken up pods are dried and the seed sieved out.

Fleshy fruits may have a germination inhibitor in them and removing this pulp enables the seed inside to begin its germination process when sown without having to wait until the pulp rots away first.

Collected fruit is kept in a plastic bag prior to cleaning to prevent it shrivelling up and becoming rubbery which makes it difficult to separate seeds from the pulp.

To clean the fruit it is wrapped in a piece of cloth and mashed by hand under a tap until it breaks up and releases the seed. This is done within 5 days of collection as we have found that if the fruit rots in the bag can also rot the seed and kill it.

Dried seed is sieved to remove unwanted debris, seed with chaff is winnowed in a winnow box, easily made from cardboard and tape. As all of our seed is for our own use we can accept a percentage of chaff in with our seed. Cleaning the last little bit of chaff from a sample can be quite time consuming. Seed is then stored in screw top jars at 3°C in the fridge.

The exception to this method is for podocarps. These species tend to lose viability if dried and are stored in barely damp substrate in plastic bags in the fridge, or sown as soon as collected and placed out in a shade house.

Seed stored damp in the fridge has to be sown within a few months as otherwise it tends to either germinate or rot off in the bags. It is also important to ensure the material is only just damp and not too wet.

We dry store seed as we keep surplus for several years in the event of a crop failure which occurs with most species from time to time. Most of the species we collect tend to remain viable for several years in dry storage in the fridge.

Seed is sown in relation to its cold requirement. Broadly, most woody plants are sown in late May or early June and placed in a shade house so that they get rain and cold over the winter. Seed with no dormancy is sown in early spring. Some species such as *Poa cita*, which have very rapid growth, are sown in late October or early November.

Germination occurs over a period in spring and seedlings are pricked out when they are big enough to handle.