

LAND MANAGEMENT

NATIVE TREES

Raising Native Plants From Seed

Introduction

Many native plant species produce abundant viable seed. The most common way of propagating native plants is by using seed.

This Environment Topic lists a number of species from which seed is reasonably easily obtained, species that are relatively easy to grow, are generally hardy colonisers with wide site tolerance, and which are more likely to be successfully planted into field situations. Some species can be open grown in nursery beds, however only container growing of seedlings is covered in this Environment Topic.

Seed collection

It is essential to collect seed when it is ripe, and the timing for this is very much a matter of local experience. The correct time for each species varies from region to region and from year to year. If no local data is available, trees you want to collect seed from should be observed from flowering onwards to determine collection times for future reference, as the seed collection times given in Table 1, on the back page are a guide only. The colour of the fruit is another guide to the ripeness of the fruit. Fruit that has fully developed the ripe fruit colour described on the table is another good indicator of when to harvest.

Seed is normally collected by hand, from the lower branches, or from the ground if the seed can be identified, and placed in paper bags (not plastic). Where seed is

out of reach, sheets of cloth can be suspended out of reach of rodents to intercept falling seed. Light seed that is normally dispersed by wind needs to be harvested before the seed capsules open.

Seed can also be collected in late autumn by raking up the humus (duff) from the forest floor.



When the seedlings reach 20 - 50mm tall they need to be 'pricked out' and planted into individual containers.

To get a good quantity and range of seeds, duff should be collected from areas of the floor that have many species present, including lots of colonising species. A wide variety of seed can be collected in this way including other plants brought in by birds. The duff should be sieved to remove the coarse bark and twigs. The major drawback of this method is the problem in identifying the seedlings after the seed has germinated.

Seed cleaning

Some seeds require cleaning before sowing or storing to remove material such as fleshy fruit or seed husks.

Precise treatments are shown in Table 1, but include:

- Soaking in water for 2 - 3 days to remove fleshy fruit e.g. Coprosma.
- Rubbing seeds together to remove husks e.g. Titoki.
- Sieving to separate the seeds from fruit, husks and leaf litter.

Seed treatment

In the natural forest many native species produce fruit that ripens in the autumn. Seeds that drop to the ground need to remain dormant until cold winter conditions have passed. Other species produce seeds with hard cases, or large fleshy fruits, which are eaten by birds, thereby ensuring they are distributed widely. Hard seed cases protect the seed but are softened by digestive acids, allowing the seed to germinate when it drops to the ground. These natural conditions need to be duplicated when seeds are collected directly from the parent tree to ensure successful seed germination.

Cold treatment (stratification)

Stratification is normally carried out by soaking the seed for 12 to 24 hours. The seed is then mixed with a moist medium such as compost, peat, sand or well rotted untreated sawdust (normally 1 part seed to 2 parts medium by volume). This mixture is placed in containers such as polythene bags, which are ideal for preventing moisture loss while allowing some exchange of oxygen and carbon dioxide. If outside winter temperatures are suitable (2 - 7 degrees Celsius) the containers can be placed in a shady spot for 1 - 4 months.

The mixture needs to be kept moist, but well drained and oxygenated. If outside air temperatures are not suitable, the containers can be refrigerated, taking care to observe the temperatures recommended in Table 1.

At the onset of spring, or after the time suggested in Table 1, the seed-containing medium can be sown as described below.

Mechanical treatment

Hard seed coats (eg kowhai) need some form of treatment to allow water uptake, essential for germination. These seeds can be treated by dropping them into water that is just reaching boiling point. Remove the water from the heat and leave the seeds soaking for 12 to 24 hours before sowing.

Alternatively, the seed coats can be broken by mechanical means, chipping, clipping, or rubbing on sandpaper, although care must be taken not to damage or destroy the seed. Soaking this seed for 24 hours, and the resultant swelling of the seed, will indicate successful treatment. Acid stratification, mimicking digestion of the seed by birds, is only recommended for those people familiar with the method, necessary precautions, and procedures.

Seed storage

Following these treatments, seeds can be stored for future use. Air dry the seeds to avoid fungal problems then store them in dry containers at room temperature or lower. Some seeds from fleshy fruits can be cleaned and stored moist at 2 - 7°C for several months, a treatment similar to moist chilling or stratification.

Sowing in containers

There are a range of containers that can be used for seed sowing but the main requirements are that they have good drainage and are easily handled. Wooden seed trays can be made or you can use old flower pots or plastic kitchen containers and newspaper or glass can be used for lids, but it is generally easier to buy custom made plastic trays from a garden shop and these often come with fitted plastic lids or covers.

- Fill the tray with seed raising mix, which can be made from various mixtures of

soil, coarse sand, pumice sand, or well rotted sawdust. Again it is probably easier to buy a prepared mix, as these products have good physical attributes such as drainage, are sterilised (no weeds), and they contain fertiliser.

- Fill the trays with seed raising mix to a depth of approximately 50mm, and press down firmly.
- Spread the seed, or seed and duff thinly on the surface. Small seeds can be mixed with sand to give a more even spread.
- Press the seeds down using a flat piece of wood or a wooden float. Small seeds can be left on the surface, but larger seeds need to be covered to a depth equivalent of 1 - 2 times their diameter. One of the easiest ways to do this is to sieve the seed raising mix over the seeds.
- Moisten the tray contents with a fine spray or sit the whole tray in shallow water and allow the water to soak up into the tray.
- Cover the tray with a lid such as glass or plastic to reduce moisture loss, and cover the lid with newspaper to keep out the light. Place the tray in indirect light, i.e. in a shade house.
- To prevent mould, or 'damping off' fungus forming, treat the mixture with a fungicide, or remove the covers daily for about 30 minutes.
- Once the seedlings appear the covers can be removed.

Pricking out and growing on

When the seedlings reach 20 - 50mm tall, or the 2 to 4 leaf stage, they need to be 'pricked out' i.e. lifted out, and planted into individual containers. All sorts of containers can be used including yogurt pottles, peat pots, cut down cardboard or plastic milk containers or commercially produced root trainers and planter bags.

Fill the containers with fresh potting mix. This can be made from mixing 1/3 pumice, 1/3 peat, and 1/3 sand, with a slow release fertiliser mixed in. Alternatively a commercially produced potting mix can be used.

Using a small sharp object, make a hole about 20mm in diameter in the potting mix, place the seedling into the hole and press

the mix around it firmly. Moisten the mix and continue to water as the plants grow. Place the containers of seedlings in a shade house or similar environment.

Plants grown in root trainers are generally grown on until ready for planting out. Plants in other containers may need to be transferred to progressively bigger containers as they grow, always taking care to transplant the plants before there is any constriction of the roots. Seedlings are then grown on until they reach a stage or size suitable for planting out into the field. Size varies, and ranges from 20 - 40cm for faster growing species, to at least 50cm for slower growing species. Podocarps like totara should be at least 80cm tall.

Before planting out, the seedlings grown in shade houses or protected environments, need to be exposed to less protected conditions. This is called 'hardening off'. One month before planting is to occur, place the seedlings outside, but initially in a relatively shaded and sheltered spot to avoid direct exposure to frost or wind. One week before planting move the seedlings again, this time to a more exposed area to further harden the seedling off.

References

Raising Your Own Native Trees by Tony Palmer, Superintendent of Horticulture University of Auckland.

Planting Native Trees by John Millard, NZ Natural Heritage Foundation.

Native Forest Restoration. A Practical Guide for Landowners by Tim Porteous, QEII National Trust.

Plant Materials Handbook For Soil Conservation Vol 3 Native Plants by K.M. Pollock, Water and Soil Miscellaneous Publication.

For further information

For further information on Native Trees or Sustainable Land Management issues ask for other titles in this series or contact Land Management Officers at the Hawke's Bay Regional Council.

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Table 1. Seed Collection, Cleaning and Treatment for Various Native Plant Species

Botanical Name	Common Name	Ripe Fruit Colour	Seed Collection Time												Seed Cleaning Method	Seed Treatment		Other Comments	
			Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec		Sow Fresh	Stratify @ 4°C (weeks)		
<i>Alectryon excelsus</i>	Titoki	red-black		✓	✓	✓										F/S		4	Crack seed case
<i>Aristotelia serrata</i>	Wineberry	deep red	✓	✓												S/F/S/D		3	Dry seed well - apply fungicide
<i>Beilsmedia tawa</i>	Tawa	deep purple										✓	✓	✓	✓	S/F/S/D	Yes	4	
<i>Brachyglottis repanda</i>	Rangiora	off white-brown	✓	✓												F/S		4	Low germination rate
<i>Coprosma lucida</i>	Shining Karamu	orange-red		✓	✓	✓										S/F/S/D		3	Uneven germination
<i>Coprosma repens</i>	Taupata	orange		✓	✓											S/F/S/D		3	
<i>Coprosma robusta</i>	Karamu	orange-red		✓	✓	✓										S/F/S/D		3	Uneven germination
<i>Cordyline australis</i>	Cabbage tree	cream		✓	✓	✓	✓									S/F/S/D		3	Collect fully ripe seed
<i>Carynocarpus laevicatus</i>	Karaka	orange	✓	✓	✓	✓	✓									S/F/S/D		4	Soak to remove flesh
<i>Dacrycarpus dacrydiodes</i>	Kahikatea, Whitepine	red-blue		✓	✓	✓										S/F/S/D		6	
<i>Dodonea viscosa</i>	Akeake	brown		✓	✓											F/S		3	Don't sow too densely
<i>Hebe</i> spp.		brown		✓	✓	✓				✓	✓					F/S	Yes	2	Sow seed on sphagnum moss
<i>Hoheria populnea</i>	Lacebark	brown				✓	✓									F/S	Yes	3	
<i>Knightia excelsa</i>	Rewarewa	brown			✓	✓	✓									F/S		4	
<i>Kunzea ericoides</i>	Kanuka	brown			✓	✓										F/S	Yes		Sieve the seed onto mix
<i>Leptospermum scoparium</i>	Manuka	brown-grey		✓	✓											F/S	Yes		Sieve the seed onto mix
<i>Melicytus ramiflorus</i>	Mahoe	purple		✓	✓											S/F/S/D		6 - 8	
<i>Myoporum laetum</i>	Ngaio	purple			✓	✓										S/F/S/D		8 - 10	
<i>Myrsine australis</i>	Mapou, Matipo	black	✓	✓	✓											S/F/S/D		4	Seed prone to weevil
<i>Olearia</i> spp.	Tree daisy	off white			✓											F/S		2	Low germination
<i>Phormium tenax</i>	Harakeke, flax	black		✓	✓	✓										F/S		3	
<i>Pittosporum crassifolium</i>	Karo	brown-black				✓	✓									F/S/S		8 - 10	Sow with sand to get spread
<i>Pittosporum eugenoides</i>	Tarata	black		✓	✓	✓										F/S/S		5 - 6	
<i>Pittosporum tenuifolium</i>	Kohuhu	black		✓	✓	✓										F/S/S		5 - 6	
<i>Plagianthus betulinus</i>	Manatu	tan	✓	✓	✓					✓	✓					F/S		4	Treat with fungicide & insecticide
<i>Podocarpus totara</i>	Totara	red			✓	✓										S/F/S/D		8 - 10	
<i>Psuedopanax arboreus</i>	Five finger	burgundy				✓	✓									S/F/S/D		8 - 10	
<i>Psuedopanax crassifolius</i>	Horoeka	burgundy	✓	✓	✓											S/F/S/D		8 - 10	
<i>Rhopalostylis sapida</i>	Nikau	red		✓	✓	✓										S/F/S/D		12	
<i>Sophora microphylla</i>	Kowhai	brown				✓	✓									F/S			Chip or nick seed coat, drop into boiling, water, soak for 24 hours
<i>Sophora tetraptera</i>	Kowhai	brown				✓	✓									F/S			
<i>Weinmannia racemosa</i>	Kamaha	brown		✓	✓	✓										F/S	Yes	2	

S/F/S/D=soak, friction, sieve, dry

F/S/S=friction, sand, sieve

FS=friction, sieve

(Table based from "Native Forest Restoration" by Tim Porteous)