



## NRM Plan

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# Native plant propagation

## In the Northern and Yorke Region

Growing your own native plants is not only an excellent way to reduce the costs of revegetation but can be an educational and rewarding experience. Many native plants are easy to propagate and are excellent for attracting birds, providing screens and windbreaks and for establishing low-maintenance and drought-resistant gardens.

This fact sheet will introduce you to the basic principles, techniques and tools for growing some of the common plant species of the Northern and Yorke Region.

### What You Will Need

Growing native plants for your garden can be done very cheaply and easily just by finding a suitable sheltered area around the yard or garden shed and purchasing or reusing a few pots or seed trays. However, growing larger numbers of plants for revegetation projects will require some basic equipment and infrastructure.

**Pots:** Also referred to as tubes, cells or seed trays depending on their size and shape.

**Soil (Potting Media):** Soil is the most important input for growing healthy seedlings. Most Australian plants are adapted to a specific balance of soil nutrients (typically low in phosphorous) so ensure that the potting media you are using is designed for Australian plants (nutrient balances can be modified for some species by adding specific fertilisers).

**Water:** Hand watering is sufficient for small numbers of plants but larger numbers may require an automatic irrigation system.



**Labels:** Always label each group of seedlings with details of the species name, where the seed/cuttings came from and the date they were sown.

**Benches:** It is best to keep seedlings at least 30cm above the ground as this prevents roots developing outside of the pot, allows for better drainage and minimises the risk of pests and diseases.

**Wind Protection:** Exposure to wind causes rapid drying of soil and buffeting of vulnerable seedlings. Shade cloth, hedging or similar may be necessary to protect the growing seedlings.

**Shade:** Young seedlings are sensitive to intense sunlight which can burn-off young plants. A shade structure may be needed to cover young seedlings.

**Hot House:** Some species and particularly cuttings require hot and/or humid conditions to grow. This is best achieved in a hot house made of either glass or polyfilm.

**Heat Bench:** If propagating large numbers of cuttings waterproof heat mats can be used to increase the success of cuttings by gently heating the bottom of the pots to encourage root development.

## Where to Find Native Seeds

Native seeds can be easily collected from the plants on your property or can be purchased from specialist suppliers. There are guidelines to follow when collecting native seeds to ensure that plants maintain genetic diversity and to avoid the over-collection of seeds from wild plant populations (see N&Y Fact Sheet 2.018).

## Pre-treatment of Seed

Seeds of many plant species have natural dormancy mechanisms which help to ensure that, in natural situations, germination occurs during optimal environmental conditions. For successful germination of these species the natural physical barriers (such as hard seed coats or chemical inhibitors) need to be overcome. There are four common techniques used to overcome germination inhibitors and these treatments usually mimic natural processes (frosts, fires, floods, etc.) so consider the ecology of the species when planning seed treatments.

**Stratification:** Cooling seeds in a fridge or freezer for extended periods. For example Native Pine (*Callitris* spp.) seeds germinate well after 1-3 weeks in a refrigerator. However some care must be taken to prevent over exposure which can destroy the seed.

**Soaking:** Soaking in water is used to leach chemical germination inhibitors from some seeds or to allow water to enter the seed and trigger germination. For hard coated seeds such as wattles, seeds are often soaked in very hot water for up to 4 days.

**Scarification:** Scarification is the process of breaking down seed coatings on hard seeds by rubbing seeds between sandpaper or by using a sharp blade to nick the end of the seed. This allows water to enter the seed and trigger germination.

**Smoke:** Many Australian native plants germinate in response to smoke. Applying smoke to seeds can be difficult (and dangerous) so it is most common to use commercially available smoke water. This can be sprayed onto the seeds or they can be soaked in the solution overnight. Smoke water is available from horticultural suppliers.

## Sowing Native Seeds

**When to Sow:** The best time to sow for most species is in spring due to the mild weather conditions at this time of the year. This will also give the seedlings plenty of time to grow to a good size before planting in early winter of the following year. There are always exceptions; some species germinate better in cool winter conditions and some germinate better in hot summer conditions.

**Sowing Depth:** A general rule of thumb for sowing seeds is to sow it to the same depth as the width of the seed. Smaller seeds tend to have less vigour and cannot push through lots of potting media. This may also be explained by a species preference to germinate better in the light or in the dark. Commercial nurseries tend to use sand or vermiculite to cover the seeds but it does not make a great deal of difference if the regular potting media is used.

**Sowing to Seed Trays:** This involves sowing evenly into a wide shallow tray to begin with and then transplanting the seedlings into pots once they have reached a suitable size. This approach makes sowing quick and easy but requires more labour to transplant the seedlings. Trees can also develop misshapen roots caused by the transplanting.

**Direct Sowing in Pots:** This refers to sowing the seeds directly into the pots they will be in until planting time. Usually 1-3 seeds will be placed in the centre of each pot and only one will be allowed to mature (usually the healthiest and most central seedling). Direct sowing avoids the need for transplanting and disturbing the roots during seedling development.

*A tunnel made of shade cloth to protect young seedlings.*



*Sowing grass seeds*



## Commonly propagated plant species and seed types

### Fine Seeds (*Eucalyptus*, *Callistemon* and *Melaleuca*)

Fine seeds have a dust or sand-like appearance once removed from the fruiting capsules. These seeds generally germinate better in light conditions near the soil surface. Sprinkle the seeds onto the top of the soil and cover with a very light sprinkling of sand (if any) to anchor the seeds, you should be able to see the dark potting media through the sand. Try to avoid sowing too much seed as it will result in a 'carpet' of closely spaced seedlings. These species tend to germinate best in summer. Germination will take approximately 2-3 weeks.

### Hard Seeds (Wattle, Hopbush and Senna)

These are seeds which have a hard coating. This includes the genera *Acacia*, *Dodonaea*, *Senna*, *Hardenbergia*, *Kennedia*, *Templetonia* and *Davesia*. These seeds generally need to be pre-treated by scarification or soaking.

When sowing them direct make a depression with your finger (as per the rule of thumb), place 3-5 seeds into each depression and cover with sand or more potting media. These species tend to germinate best in autumn and spring. Germination will take approximately 2-4 weeks, but can be ongoing for 1 year in species such as *Kennedia*.

### Native Pines (*Callitris* spp.)

Native Pine seeds need to be pre-treated by stratification in the fridge (1-2 weeks) or by soaking in cool water (4-12 hrs) before sowing. When sowing them direct into pots make a depression with your finger (as per the rule of thumb), place 2-3 seeds into each depression and cover with sand or soil. Sow native pines in winter for best results. Note that growth is relatively slow at first and it may take 2 years before seedlings are large enough to plant. Germination is highly variable between 4 weeks and 6 months.

### Sheoaks (*Allocasuarina verticillata*)

Sheoaks typically have a high viability and should be grown from fresh seed. When sowing them direct make a depression with your finger (as per the rule of thumb), sow 3-5 seeds in each depression and lightly cover with sand. Expect germination after 3-4 weeks.

### Native Apricot (*Pittosporum angustifolium*)

Seeds of the common Native Apricot are covered in a sticky resinous material which inhibits germination. This must be cleaned off with soapy water and the seeds soaked in room-temperature water several times to clean off and leach residual resin. Sow direct by making a depression with your finger (as per the rule of thumb), place 3-5 seeds into each depression and cover with sand or soil. Germination should take place within 3 weeks.

### Saltbushes (*Maireana* spp., *Atriplex* spp., *Rhagodia* spp., *Enchylaena tomentosa*)

For those species which produce fleshy fruit ensure that it is fully dry before sowing. Germination of dry-fruited species such as the bluebushes (*Maireana* spp.) and saltbushes (*Atriplex* spp.) may be improved by soaking in room-temperature water for 24 hours to leach out salts (dry out before sowing). Make a depression with your finger (as per the rule of thumb), place 2-3 seeds into each depression and cover with sand or soil. Expect germination within one week. Suitable for direct sowing.

### Grass seedlings



## Native Grasses

Native grasses vary greatly in size and shape with some possessing long awns and others with no awn. Most native grass species are best grown from fresh seed although some, such as the Speargrasses (*Austrostipa* spp.) have an after-ripening period during which germination rates are low, meaning seeds should be stored for at least a year before sowing.

Germination of Kangaroo Grass (*Themeda triandra*) can be improved by removing the awns, pre-treating with smoke water or actually setting fire to the seed. Kangaroo Grass, Lemon-scented Grass (*Cymbopogon* spp.) and Speargrasses should be sown into seed trays as they are sporadic germinators.

Most other grasses can be effectively sown direct. Place seed on the surface of the potting media and cover with 5mm of sand. Seeds with large awns such as Speargrasses often sit above this sand, however avoid the temptation to add more sand as most will naturally drill their seed heads into the sand.

Note that native perennial grasses are generally either winter-growing (Wallaby Grasses, Speargrasses, *Poa* spp.) or grow more actively in summer (Kangaroo Grass, Windmill Grass, 3-awn Grass, Bottlewashers) and this may impact when you sow (autumn for winter-growers and spring for summer growers). Grass germination generally takes between 1 and 4 weeks.

## Daisies

This covers genera such as *Brachyscome*, *Minuria*, *Olearia*, *Senecio* and *Vittadinia*. These plants generally have fluffy seeds which need to be gently pressed into the top of the potting media. This can be done with a piece of board or by hand. To ensure the seeds anchor and do not blow away sprinkle a light covering of sand over the top. Fresh seed will give the best germination rates. Germination should take place within two weeks but secondary germination can be ongoing for 12 months.

## Wetland Reeds and Rushes

Many wetland species such as *Juncus*, *Cyperus*, *Bolboschoenus*, *Schoenoplectus* and *Phragmites* germinate best in permanently saturated potting mix. This can be achieved by lining a seed tray or pot with plastic or by keeping the pots in a pond. Ensure the water level is below the top of the potting media. These species germinate best in hot conditions.

*Evenly sowing seeds in a seed tray.*



*Dividing Saltbush seedlings.*



*Saltbush seedling in a pot.*



## Vegetative reproduction

Some species do not germinate readily from seed under nursery conditions and can only be reliably grown by vegetative reproduction; this means using mature plant material for cuttings, layering or division. Plants grown using vegetative methods are genetic clones of the parent plants so try to propagate from many individuals to maintain genetic diversity.

**Cuttings:** Cuttings are small sections (7-15cm) of stem and leaf that are cut off from an existing, usually established, actively growing plant. Most species grow best from soft tip cuttings although there are many which grow best from older hardwood to semi-hardwood cuttings. The bottom of the cuttings is usually dipped in rooting hormone solutions or gels to encourage root growth but honey can be used as a cheap and effective substitute for commercial products. Perlite, coarse sand, sphagnum moss or other light and aerated material is often used instead of regular potting media to allow easy root development.

Cuttings strike best in humid conditions such as a hot house as it is important to keep the foliage moist and warm (this can be done with a mister or household spray bottle). Plants commonly grown from cuttings include Boobialla (*Myoporum* spp.), Emu-bushes (*Eremophila* spp.), Grevillea spp., *Correa* spp. and a number of Daisies (*Olearia* sp., *Chrysocephalum* spp.).



*A daisy cutting prepared for propagation.*



*Layering of Common Reed segments on wet soil.*

**Division:** This process is used to propagate plants which grow from rhizomes (lateral creeping or fibrous root systems). Established plant material is cut (divided) into many pieces, each with sufficient roots to survive as individual plants. Each 'division' is then placed in its own pot or sometimes directly into the ground.

**Layering:** Some species of plants readily form roots when their stems come in contact with the soil (e.g. Coastal Spinifex, Common Reed). By laying these stems on top of or just below the surface of moist potting mix roots can develop at nodes along the stem. Once sufficient nodes have rooted the stem can be divided (as above) to create separate plants. This is usually done in a hot house as per the cuttings methodology.

A permit is required to collect cuttings from public land (see N&Y Fact Sheet 2.019).

*Cuttings in potting media.*



## Seedling Care

Generally pots and seed trays are kept in cool and shady conditions to promote germination. Once seedlings have established good root growth they should be moved into partial or full sunlight (depending on the type of plant) to provide optimal growing conditions. Plants need to be 'hardened-off' in outdoor sunny conditions for at least a month before they are to be planted in order to reduce shock at the time of planting.

*Seedlings germinating and growing under part shade.*



*Labelled seed trays.*

## Tips

- The aim of all propagation methods is to ensure consistency so treat each batch of seeds or cuttings the same way, with each plant growing in the middle of the pot so that each resulting seedling will look the same.
- Record everything you do. That way if something works or does not work you can learn from it for future propagation projects.
- Watering should aim to keep the soil damp but not wet. Wet and soggy soil will cause root-rot and attract fungal infections.



*Benches for keeping pots off the ground.*

### **Further Information**

Berkinshaw, T. (2006). Native Vegetation of the Northern and Yorke Region. Finsbury Green Printing.

Bonney, N. (2003). What Seed is That? Finsbury Press.

Ralph, M. (1997). Growing Australian Native Plants from Seed.

### **Other NRM Fact Sheets**

Seed Collection

Plant Identification

### **Help and Assistance**

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