

PROPAGATION PROTOCOLS

This document is intended as a guide for Tamborine Mountain Landcare members who wish to assist our regeneration projects by growing some of the plants needed. It is a work in progress so if you have anything to add to the protocols – for example a different but successful way of propagating and growing a particular plant – then please give it to Julie Lake so she can add it to the document. The idea is that our shared knowledge and experience can become a valuable part of TML's intellectual property as well as a useful source of knowledge for members.

As there are many hundreds of plants native to Tamborine Mountain, the protocols list will take a long time to complete, with growing information for each plant added alphabetically as time permits. While the list is being compiled by those members with competence in this field, any TML member with a query about propagating a particular plant can post it on the website for other members to answer.

To date, only protocols for trees and shrubs have been compiled. Vines and ferns will be added later.

Fruiting times given are usual for the species but many rainforest plants flower and fruit opportunistically, according to weather and other conditions unknown to us, thus fruit can be produced at any time of year.

Finally, if anyone would like a copy of the protocols, contact Julie on jrlakemedia@primus.com.au and she'll send you one.

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Growing from seed

This is the best method for most plants destined for regeneration projects for it is usually fast, easy and ensures genetic diversity in the regenerated landscape.

COLLECTING SEED

As a general note, seed is best collected while still on the tree or bush. With seed contained within a fleshy fruit, the colour of the fruit at maturity must be known because only seed from ripe fruit is viable. Seed on the ground is too often contaminated by parasites to be useful; lilly pilly (*Syzygium spp.*) are very often infected in this way. Some fruit, for example Blue Quandong (*Elaeocarpus grandis*) CAN be collected from the ground but a careful check should be made to see that the fruit is intact and in good condition – firm, unmarked and not too wrinkled. The same advice applies to seeds in capsules (e.g. *Dysoxylum*, *Jagera*, *Sloanea*) – collect from the tree and only take from the ground if you can be sure it has fallen within the past few hours. SEE PAPER ON SEED COLLECTION FOR GENETIC DIVERSITY – AVAILABLE FROM JULIE

Collected seed should be placed in a clean brown paper (preferably) or plastic bag and kept in a cool, dry place (e.g. NOT a hot car!) until it can be home. Seed from most rainforest plants has short viability so should be treated (if necessary) and sown within 24 hours of collection. Seed with longer viability can be stored in the frig.

Seed should not be collected from a National Park and permission is needed to collect seed on privately-owned or local authority land.

CLEANING AND TREATING SEED

Equipment: 1 large sharp knife and 1 small sharp knife. Gloves (some seeds have irritating hairs or contain irritating chemicals). Large, strong sieve. (Old screen doors can be used if you are cleaning large quantities of seed). Hair dryer (for drying damp seed in a hurry). Buckets or basins for soaking seed.

Cleaning

All seed should be removed from the seed case, or have the outer flesh and/or aril removed before sowing; removal of outer flesh is particularly important with fruits that in nature are eaten by birds that then excrete the seed. Flesh remaining on the seed encourages fungal disease and can inhibit germination. Thorough cleaning is only required if seed is to be stored, to prevent rot. Some seed needs to be soaked for up to 48 hours to get rid of grubs. This also helps to dissolve the waxy coating on some seeds. Small seeds with a lot of soft flesh attached can be rubbed through a sieve.

Treatment

Some seeds require special treatment to initiate germination. With a few species such treatment is so specialised and difficult that we shan't deal with it here but focus on those plants that can be propagated reasonably easily in the home garden.

Other seeds have very hard coats and need a lot of processing so that germination can take place. The usual method is to nick them with a sharp knife to allow water to penetrate through the outer coating. Seeds of *Alphitonia* and *Commersonia*, both used extensively in our regeneration projects, should be first boiled for about five minutes and then left to soak for 48 hours.

Here are the more common types of fruit and how to deal with them:

Crisp, fleshy fruit, single seed: (*Syzygium* spp., many *Lauraceae*.) Break open, peel or cut fruit and remove seed. Soak for 48 hours in warm water then clean with a hard brush or steel wool to remove any remaining flesh.

Crisp, fleshy fruit with a few large seeds: Same as above

Large, firm fruit containing hard capsule (stone) protecting the seed (kernel): (*Elaeocarpus*, *Macadamia*). Stone needs to be nicked, filed, cracked or heated to allow seed kernel to germinate, however this can kill the seed if it isn't mature enough to germinate. With some plants it is necessary to sow the seed and wait, perhaps for several years, before germination occurs naturally (in such cases cuttings might be a short-term solution). See individual plants for information.

Fleshy fruits with multiple small seeds: (*Ficus*, *Tasmannia*, *Rubus*) Soak and rub through a sieve if seeds are not large enough to be easily removed. Fruits containing very tiny seeds can be crumbled up in a container of fine sand; rub the mixture around to abrade and thus clean the seed, then sow the seed/sand mix.

Capsules with hard seeds covered by arils: (*Dysoxylum*, *Sloanea*, *Jagera* and other *Sapindaceae*): Remove seed from capsule, remove aril (outer coating) and sow immediately. Capsules may need to be cut or broken open. Drying in an oven (not microwave) or in a pot over a barbecue can be used to open capsules of certain plants, but requires expertise so that the seed is not damaged by over-heating. This applies also to drying capsules in open sunlight, as is done with some non-rainforest plants.

Capsules with many tiny seeds: (*Caldcluvia*, *Quintinia*, *Lophostemon*): Remove seeds from capsule (using great care as they are easily lost or blown away) and sow on top of a coarse medium such as peat or an orchid mix; cover with fine netting, shade cloth or any material which will protect the seeds from drying out but won't allow them to become too moist, particularly in humid weather.

Capsules containing winged, usually papery, seeds: (*Argyrodendron*, *Backhousia*, *Flindersia*): Remove seed from capsule and sow, with a very light covering of growing medium, sand or even perlite/vermiculite.

With really difficult seed such as that of wattles and many pea flowers (*Hovea*, *Pultenaea* etc.) the seed should be soaked in boiling water and left for at least a week, changing the water every three days. Coca cola has been used successfully to germinate seeds such as *Gahnia* (a sedge) and experiments are being done with vinegar and citric acid.

STORING SEED

Most fleshy fruits do not store well and seed should be sown as soon after collection as possible.

Where seed IS to be stored, remove outer flesh and clean seed thoroughly with a stiff brush or steel wool. Dry seed before sowing, in the sun or with a towel; too much moisture on the seed coat encourages pathogen disease, rotting and seedling damping off. Large quantities of fleshy fruits can be soaked in water for 48 hours to soften and then pressed through a coarse sieve so that the seed comes away clean.

Label and date seed before storing

Store in a sealed, air-tight container in a cool, dry place. Humidity can encourage fungal diseases that destroy stored seeds.

Short-stored seed (up to 6 months) can be kept in a paper or cloth bag, or envelope. Longer periods require a properly sealed, preferably glass, container at a temperature no higher than 25°C. When temperatures are high, store in the crisper section of a refrigerator or in an air-conditioned room. Keep insects at bay by including cloves, bay leaves, moth balls or similar deterrents in the bag or jar.

SOWING SEED AND AFTER-CARE

The plastic punnets used by commercial nurseries are best because they are designed for the job. Flat trays are fine, especially for very small seed, but the multi-cell punnets are particularly good because you don't have to worry about spacing; just stick a couple of seeds in each cell. (Sowing in pairs means if one seed doesn't prove viable there's a good chance the other will; if two come up they can be separated later). Otherwise, any flat container will do provided it has adequate drainage holes. If the holes are too large and water drains too freely, the growing mix (and the tender little developing plant roots) will dry out too quickly. Don't over-sow small seed in the trays or you'll get a mass of weak seedlings. Larger seeds (more than, say, 5mm – remember, we are talking about SEED size here, not fruit size) can be sown direct into pots. The punnets should be cleaned of any soil and then washed in a sterile solution; bleach, disinfectant or vinegar mixed with water at the recommended rate for sterilisation are all fine, as are commercial preparations based on sodium metabisulphide (as used in home brewing and pickling).

Seed should be pressed lightly into the mix and covered with a fine layer. Twice the maximum diameter of the seed is a suitable depth but it's not that important. Press the covering mix down lightly but firmly with your fingertips or any flat object with a knob or handle on top. Very fine seed should be scattered on the surface of a flat punnet or tray with just a sprinkling of the growing mix over it. Water lightly and keep moist (but never wet) with daily waterings (twice daily in very hot and dry weather). An overhead sprinkling system, either automatic or manually operated, is of course ideal, but most of us use a small watering can with a fine rose. Just don't let the growing mix dry out because water is essential for successful germination, as well as for seedlings and growing plants.

Place trays in a warm, shaded, protected spot such as a shadehouse, garage, carport or part of a verandah. When the seedlings start to grow upwards and develop leaves, give them a light misting each day and prepare to pot them out.

PRICKING OUT AND POTTING ON

When seedlings develop their second set of leaves (the true-leaf stage; this applies to most plants but exceptions will be noted in the plant list below), it is time to prick them out and put them in a pot. First prepare the pot; for our work the best pots are the small, deep, narrow plastic tubes or pots that encourage good long, strong root development. But any small pot will do, provided it is not too shallow (at least 10cm deep)

Fill the pot about 2/3 full with the growing mix*.

Remove seedling from the punnet/tray very gently, using a small spoon or narrow potting trowel. Try and keep as much soil as possible around the tiny, delicate roots that should be just starting to form at this stage.

Place in prepared pot and fill up with mix, firming the plant in as you go. Water so that the mix is soaked through.

Put back into potting area and water regularly so that the mix is thoroughly wetted each time, right down to the bottom of the pot. Twice daily in very hot weather, unless you have an automatic (on timer) or semi-automatic (switched on manually) watering system. The mix should remain damp between waterings but not soggy.

Keep pots free of weeds.

Damping-off: Seedlings can suddenly collapse and die due to a condition called “damping off”. This fungal disease is most likely to occur in cold, wet weather. Seed can be protected by dusting with a fungicide before sowing – for example Bordeaux mixture, copper oxychloride or other commercial products available for this purpose. Another method is to treat seedlings after they sprout in the punnet by drenching the growing mix with a commercial preparation such as Mancozeb. Some native plant nurseries prefer to treat the pot rather than the plant, washing with a fungicide such as Phytoclean – and this is probably the easiest solution for the home-grower. Plant protection is costly and time-consuming but it’s discouraging to lose a batch of seedlings that may have taken long, hard hours of collecting and preparation. The best precaution against damping-off is good hygiene

GENERAL HYGIENE

The importance of keeping the propagation area clean can’t be over-stated. **Always ensure pots are sterilised before and between use and at all stages when handling seedlings, make sure your hands and tools are clean. Keep a bucket of disinfectant handy when sowing seed and potting on; rinse hands and tools at regular intervals to minimise disease risk to the baby plants.** And not just pots, trays and all tools/utensils but also benches must be kept clean if seedlings are to remain healthy at their most vulnerable stage. Yes, some of us produce a few seedlings quite successfully in our back yards without much fuss, but any attempt to raise them on a larger scale will fail if we don’t try and maintain best nursery practice. What’s worse, diseased plants from one source (not always obvious to the human eye) can spread to other plants in a regeneration site. Wash benches down regularly with a chlorine solution or some other antibacterial, biocidal disinfectant. Vinegar is more environmentally friendly than chlorine.

WHEN TO PLANT OUT

Pot-bound rainforest plants, where the roots instead of continuing downwards are so

restricted that they start to encircle one another and even grow upwards, are worse than useless in the ground. So it's important to leave the seedlings in the pot for just the right length of time. The easiest way to tell (though it takes a bit of experience) is to feel the tube/pot. If it feels quite firm, rather like the "spring" of a well-done cake when you take it out of the oven, then it's time to plant. If it is very hard to the touch, with no "give" at all, then the plant has been there too long. If it feels too soft and loose, with no "spring", then the soil is too loose around an undeveloped rootball and the plant needs more time in the pot.

***GROWING MIXES**

Commercial growing mixes are easy to use and, more importantly, good mixes are sterilised which helps prevent problems such as damping-off. They also have just the right blend of ingredients. It is VERY important to buy a mix made by a reputable manufacturer, especially one made in Queensland because such a mix is best suited to our climate conditions (for example mixes break down and lose nutrient power much faster in hot weather). DON'T use a cheap mix which may include ingredients actually harmful to young plants. Use only those that have the four standards Australia ticks on the pack; these are guaranteed to be formulated to at least a minimum standard. At the same time, there's no need to buy "premium" mixes with added nutrients; these are intended for long-term pot culture.

If you prefer to make your own mix, a suitable seed-growing mix is two parts clean river sand to one part perlite mix with fine peat moss. It must be thoroughly sterilised before use. A suitable growing mix for potted-on rainforest plants is one part river sand, one part finely shredded bark or coconut fibre and one part leaf mould or peat moss. A fine loam can be substituted for the bark/coconut fibre. Again, the mix should be thoroughly sterilised with steam.

CUTTINGS

Many rainforest species can be successfully raised from cuttings. These are best struck in warmer weather, when temperatures don't drop below 15 degrees.

For shrubs and trees the best material comes from the tips of half-hardened branches. The cuttings should be about 8cm long, with the lower cut made just below a node. Use a very sharp, clean knife.

Strip away bottom leaves (from about the lower 2/3 of the cutting), leaving two or more young leaves at the top. Large leaves (more than about 4cm long) can be cut straight across the blade, to about 1/3.

Second cuttings can be taken from the same branch, with the top cut made just above a node.

Hormone rooting powder can be used successfully with most species to speed up root

initiation but is not necessary and adds to costs.

Washed river sand is the cheapest growing medium, or a mix of one part each of sand, perlite/vermiculite and peat moss, though commercial propagation mixes are safer because guaranteed sterile.

Pots or well-drained trays of any kind can be used (including polystyrene fruit trays) provided they are deep enough for the cuttings to root. Put the cuttings into the filled pot and press the mix around until it is held firmly in place.

Water in well and then cover to retain moisture and protect from drying wind. A simple cover can be made by placing a clear plastic bag over some kind of frame (wire, plastic) that holds it well clear of the plant. This should be tied firmly around the pot just below the rim and capable of being easily removed for watering. Whole trays (or large tubs) of cuttings can be covered in this way. Covering cuttings is not strictly necessary but it does give the plant a better chance of successful root development.

Water regularly so that the growing mix is kept just moist all the way to the bottom of the pot. Daily misting (or even twice-daily in very dry, hot and/or windy weather) is strongly recommended. Cuttings should be kept in a sheltered, shaded spot (under 50-60 per cent shade cloth is ideal) but it is best to keep them “hard” to prepare them, right from the start, for the rigors of survival in the wild state. Don’t soften them with over-protection such as polythene igloos. Those species that are to be planted out into full sun should be hardened off first by leaving in a sunny spot a few days before planting.

The “garden patch” method

The long and often uncertain germination period exhibited by so many Australian rainforest species makes it difficult and frustrating to raise them from seed in the backyard potting shed. It's all too easy to forget to water and otherwise care for pots that don't show a trace of green for many months. Another method is to set aside a patch of shaded ground in your garden as a seedling bed. If ground is very hard here, dig it over lightly and add leaf and twig litter – preferably natural forest litter. The idea is to simulate the conditions of the rainforest floor as closely as possible. Treat seeds in the usual, recommended way and plant here, remembering to label each “bed” so you won't forget what you've planted. For example, if you sow a dozen seeds of *Cryptocarya laevigata*, mark off the section and put the name of the plant, and the number you've sown, on the label. Duplicate this information in a notebook or on your computer because label information can get smudged or washed away. Then, leave the seeds to nature, remembering to check at regular intervals. When the young plants produce some well-grown leaves, transplant them into a pot for growing-on until they are ready for use. This is a good method for several of the cryptocaryas, endiandras and others in the *Lauraceae* family, or any other species that take more than six weeks or so to germinate. The plants have a good chance of establishing themselves by natural means without too much supervision on your part and if they fail to germinate you haven't wasted either time or precious water on them.

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For shrubs and trees the best material comes from the tips of half-hardened branches, or semi-ripe mid-sections of branches. Cuttings from harder, older wood are more difficult to strike. The cuttings should be about 8cm long, with the lower cut made just below a node. Use a very sharp, clean knife.

Strip away bottom leaves (from about the lower 2/3 of the cutting), leaving two or more young leaves at the top. Large leaves (more than about 4cm long) can be cut straight across the blade, to about 1/3.

Second cuttings can be taken from the same branch, with the top cut made just above a node.

Hormone rooting powder or liquid can be used successfully with most species to speed up root initiation but is not necessary and adds to costs.

Washed river sand is the cheapest growing medium, though a mix of one part each of sand, perlite/vermiculite and peat moss/cocopeat works best for rainforest plants. A mix of one part perlite/vermiculite to four parts cocopeat is better for dry rainforest/sclerophyllous plants. An excellent albeit more costly alternative is to buy foam cell blocks, similar to Oasis florist foam (available from nursery supply outlets) and place a cutting in each block. This medium is very sterile and also holds moisture around the roots from one watering to another.

Pots or well-drained trays of any kind can be used (including polystyrene fruit trays) provided they are deep enough for the cuttings to root. Put the cuttings into the filled pot (or sterile foam) and press the mix around until it is held firmly in place. If you are using a rooting hormone powder then make a hole in the mix with a pencil or similar, so the plant stem can be inserted without rubbing off the powder.

TREES AND SHRUBS

Alphitonia excelsa (Red Ash)

Description: round to ovoid black fruit with a ridge round it just above the base. Within are two dry, hard capsules containing lots of small red-brown seeds that may stay on the twigs for months after the rest of the fruit has fallen.

Time: Autumn (sometimes to early winter)

Germination: Erratic and usually slow

Method: nick the hard seed coat, sow plentifully – and be patient. If you have room, sowing lots of seed straight into the ground in a sheltered patch in the garden can yield good results as the seed should in time germinate when it senses conditions are right. Then you can “harvest” the seedlings and grow them on.

Germination: erratic, slow and difficult. Conditions for germination remain mysterious, especially considering its prolific production and the number of young trees growing in wild or disturbed areas.

Comments: seed stores well for months

Alpinia coerulea (Native Ginger)

Description: Small, bright blue shining fruits on a long stem

Time: Autumn

Germination: usually 6-8 weeks

Method: Remove seeds from flesh, soak for 24 hours and then sow the fresh seed as quickly as possible.. Don't store for more than a few days.

Comments: Seed has short viability. Can also be propagated by rhizome division.

Archidendron grandiflorum (Lace-flower)

Description: orange, curling pods, splitting to reveal round, shiny black seeds.
usually autumn but may fruit throughout the year

Time:

Method: sow fresh seed immediately.

Germination: uncertain - be patient

Comments: Seeding is erratic and seeds are often slow or recalcitrant in germination. Seedlings slow and often unthrifty.

Argyrodendron actinophyllum (Black booyong)

Description: small brown seeds in pairs with papery wings attached. These usually

separate once detached from tree.

Time: usually winter, sometimes May also

Method: sow seed immediately and cover lightly with growing medium.

Germination: within 1 - 3 weeks of planting.

Comments: viability uncertain after falling so don't store.

***Arytera distylis* (Twin-leaved coogera)**

Description: yellow lobed capsule containing 1 or 2 black and red bullet-shaped

Time: summer

Method: remove seeds from capsules, soak for 24 hours and sow immediately.

Germination time: about three weeks

Comments: short viability

***Backhousia myrtifolia* (Grey myrtle)**

Description: tiny dry seeds surrounded by a hypanthium (enlarged receptacle under the calyx)

Time: autumn

Method: seed can be sown, but see below

Germination: uncertain; viable seed may germinate quite quickly but unviability can be a problem

Comments: this backhousia is best grown from cuttings

***Baloghia inophylla* (Scrub bloodwood)**

Description: Three-lobed, grooved greenish-brown (sometimes turning blackish) fruits with a red-brown seed capsule in each lobe

Time: summer to early winter

Method: remove seeds from capsules and sow quickly

Germination: fast and easy

Comments: Fruit can be collected while still not quite matured and on the tree. However, NB, capsule does not always contain seed

***Brachychiton acerifolius* (Flame tree)**

Description: large, dark brown boat-shaped pods which split to reveal many brownish-yellow hairy seeds

Time: winter

Method: sow seed just below surface of growing medium. Scatter a bit of leafmould on top (helpful but not essential)

Germination: usually 2 - 4 weeks

Comments: very easy to germinate and grow, and seed can be stored for 12 months or more

***Brachychiton bidwilli* (Rusty kurrajong)**

Description: fawn to rufous, velvety boat-shaped pods containing lots of small seeds

Time: autumn

Method: sow as for *B. acerifolius*.

Germination: 4 - 8 weeks, perhaps longer

Comments: very easy to germinate and seed can be stored for several months

Brachychiton discolor

Description: brown velvety or very hairy boat-shaped pods containing many seeds

Time: autumn to late spring (November) depending on rainfall and other factors

Method: sow as for *B. acerifolius*.

Germination: 4 - 8 weeks, perhaps longer

Comments: very easy to germinate and seed can be stored for at least 12 months, with reports of successful germination after two years or more.

***Caldcluvia paniculosa* (Rose leaf marara)**

Description: Large clusters of tiny brownish red round or oval capsules containing a few minute seeds.

Time: February-April

Method: Allow the fresh capsules to dry out for a week until they split to release the seeds

Germination: 2 - 4 weeks

Comments: Easy to grow from seed and cuttings

***Capparis arborea* (Native pomegranate)**

Description: Large (to 4cm), round, dark green fruit containing many small seeds.

Time: Summer to early autumn

Method: Remove flesh and seeds, soak in warm water to remove flesh from seed and press through a coarse sieve. Sow immediately.

Germination: Uncertain but probably within 2 weeks

Comments: Can also be grown from cuttings

***Castanospermum australe* (Black bean, Moreton Bay Chestnut)**

Description: Long, large, blackish pods containing several large, brown, shiny, chestnut-type seeds

Time: February - April/May

Method: Remove seeds from pod and sow into trays, pots or straight into the ground

Germination: 2 - 4 weeks

Comments: Seed is almost always viable and germinates very swiftly; can be stored for a few weeks but tends to sprout quickly in storage. One of the best types of seed to broadcast around a site, if required.

***Cinnamomum oliveri* (Oliver's sassafras)**

Description: Black, fleshy, oval fruit, sometimes covered with a yellowish powder, containing a single seed

Time: March - April

Method: Soak fruit for 48 hours then remove all flesh and clean thoroughly before planting.

Germination: Not certain - probably within 4 weeks

Comments:

***Citrus australasica* (Finger lime)**

Description: Yellow, green or black finger-shaped fruits to about 5cm long; subspecies *C.australasica sanguine*, rare and native to Tamborine, has reddish skin and pink flesh. Several shiny brown seeds to each fruit.

Time: May – December

Method: Clean seed lightly in warm water before sowing

Germination: Very slow and erratic – could take several months

Comments: Hard to grow from seed or cuttings but worth the effort in secondary plantings

***Commersonia bartramia* (Brown Kurrajong)**

Description: Bristly brown capsules which split into five segments containing several small black seeds.

Time: summer and autumn

Method: treat seeds with boiling water (see "seed treatment" section) before sowing.

Germination: usually within 4 weeks but can be erratic, especially as seed can often prove infertile

Comments: Usually easy and fast to grow from seed but also grows well from cuttings

***Cordyline petiolaris* (Broad leaved palm lily) *C. rubra*, *C. congesta*)**



Description: Panicles of round, bright red fruit containing black seeds

Time: February to late autumn

Method: it is best to remove flesh before sowing, though fruit planted direct into growing medium will often readily sprout

Germination: fresh seed will usually sprout within 2 - 4 weeks but sometimes up to 8 weeks.

Comments: Seed is easy to collect and grow; propagation can also be done from stem cutting or root division

Cordyline rubra and *C. congesta* (which has orange-red fruit) are propagated in the same way.

***Cryptocarya glaucescens* (Jackwood)**

Description: Hard, round, glossy black fruits with a ribbed and flattened outer coat containing a single brownish seed.

Time: Autumn and winter

Method: No need to remove dry outer coating but sow fresh seed direct into tray or pot. Seedlings often slow.

Germination: 2 - 4 weeks

Comments: Fruiting does not take place every year so seed can be hard to collect.

***Cryptocarya erythroxylon* (Pigeonberry ash)**

Description: Black ovoid or slightly pear-shaped fruit containing one seed.

Time: Late spring (November) through summer

Method: Sow fresh, first removing flesh from seed

Germination: Not sure - but quite fast

Comments:

***Cryptocarya laevigata* (Glossy laurel)**

Description: Orange-red, slightly ovoid fruit, borne singly and containing one ribbed seed.

Time: Late summer to Autumn

Method: Sow fresh, first removing flesh from seed.

Germination: Slow and unpredictable

Comments: This is usually a sparsely fruiting plant so seed is hard to find and never plentiful. Can be grown from cuttings though these are slow to root. Best with bottom heat and use of rotting hormone may produce faster results. Seedlings slow also and should not be planted out until root system well developed.

***Cryptocarya microneura* (Murrogun)**

Description: Round black fruit with a nipple on top, containing one green-covered seed

Time: Summer, mostly December

Method: Sow fresh, first removing outer flesh from seed. No need to remove green aril.

Germination: Not sure but fresh seed germinates quite freely

Comments: More information needed

***Cryptocarya obovata* (Pepperberry)**

Black/blue black, slightly pear-shaped fruit with with flattened top, each containing one hard seed.

Time: From early autumn to early spring

Method: Sow fresh seed

Germination: Usually 2 - 4 weeks, may be longer.

Comments:

***Cryptocarya triplinervis* (Three-veined cryptocarya)**

Description: Small, black, shiny, ovoid fruits borne in masses, each fruit containing a single hard seed.

Time: Winter (usually ripening in July) to early spring.

Method: Sow fresh; for best results remove outer flesh from seed.

Germination: 2 - 4 weeks

Comments:

Cupaniopsis newmanii (Long-leaved tuckeroo)

Description: Orange/pinkish brown velvety three-capsuled fruits containing up to three black seeds

Time: October, November

Method: Sow fresh, first removing seed from capsule and soaking for 48 hours

Germination: 2 - 4 weeks

Comments: Propagation of this fairly rare species requires permission under the Nature Conservation Act

Daphnandra Sp. McPherson Range (Socketwood)

Description: Elongated, ovaloid, brown, hairy, woody fruit containing several small, hairy seeds

Time: Summer

Method: See comments

Germination: See comments

Comments: Seed is hard to find, often unviable and slow to germinate. This plant is best grown from cuttings.

Decaspermum humile (Silky myrtle)

Description: Small, roundish, black fruits containing 2 - 10 black seeds.

Time: Late autumn to late winter

Method: Sow fresh, first removing outer flesh

Germination: No information

Comments: Can also be grown from cuttings

Diospyros pentamera (Black plum)

Description: Red or yellow

Time: Late winter through spring

Method: Sow fresh, first removing flesh from seed

Germination: Very slow; may take several months or even longer

Comments: Germination very unreliable

Diploglottis australis (Native Tamarind)

Description: Hairy, brownish-yellow capsules with two or three lobes, splitting to reveal succulent yellow fleshy arils covering two or three small brown seeds.

Time: Summer

Method: Sow fresh, first thoroughly cleaning flesh from seeds

Germination: 1 – 2 weeks

Comments: Fast and easy; seed usually shows good viability

***Ehretia acuminata* (Koda)**

Description: Yellow fruit splits into two segments, each with a dull brown seed.

Time: Summer

Method: Remove seeds from fleshy outer coating and sow immediately after collection. This can be done with fingernails (if sharp!) to scrape off as much of the flesh as possible, as this seed is very small. Then rub seed in the palm of the hand with a small quantity of sand, to clean off the remaining flesh and slightly abrade the seedcoat.

Germination: Usually within 2 weeks

Comments: Very fast and easy to germinate and grow

Elaeocarpus sp.

With all *Elaeocarpus* (Quandong) first remove flesh from stone (this is easier if allowed to soak overnight); give stone a few days to dry and then crack. Don't remove kernel but plant cracked stone (stone can also be filed down to reveal the seed, but cracking is better. Seed can be stored (in shell, in a dark, dry place).

***Elaeocarpus grandis* (Blue quandong)**

Description: Large, round, bright blue-skinned fruit up to 3cm in diameter; inner flesh is green containing a hard, wrinkled stone protecting the actual seeds.

Time: Spring - Summer

Method and germination: As above, using a vice to crack the very hard seedcoat.

Germination can take several weeks.

Comments: Grows easily from cuttings

***Elaeocarpus kirtonii* (White quandong)**

Description: Small, oval, pale blue fruits containing hard, wrinkled stones protecting one or two seeds.

Time: Spring and early summer

Method and germination: As above; can be slow to germinate

Comments: Grows easily from cuttings

***Elaeocarpus obovatus* (Hard quandong)**

Description: Small, slightly oval, bright blue fruits (leaves and fruits are like a smaller version of the more familiar *E. grandis*). The (usually) single seed is protected by a hard, bumpy stone.

Time: January to March

Method and germination: As above but germination is usually very slow and recalcitrant. Soaking for 48 hours in warm water before sowing MAY help initiate germination.

Some people report success from making sure the seed is removed completely from the cracked shell and sowing it in a natural growing mix of leaf litter. Either in the usual tray or a selected, well-marked plot of ground. Particular and little-understood conditions (soil temperature, rainfall etc.) may influence germination so it pays to leave this seed for a while and see what happens.

Comments: Apart from the foregoing, this plant can also be difficult to strike from cuttings. Rooting hormone may help. Growing mixture MUST be kept moist (not saturated but not allowed to dry out, either) and a warm place with a fairly constant temperature minimum of not lower than 25 degrees Celsius is recommended.

***Elattostachys nervosa* (Green tamarind)**

Description: Orange (or yellowish) capsules with pink inner layer, splitting into three segments each containing a shiny black seed.

Time: Autumn to early winter

Method: Remove seeds from capsules and sow immediately,

Germination: Usually within two weeks

Comments: Seed germinates easily but in any growing season capsules may be low in seed content so a good number need to be collected.

***Endiandra muelleri* (Green-leaved rose walnut)**

Description: Black, oval, shiny fruits each containing one seed.

Time: Autumn

Method: Remove seed and remove flesh, soaking if necessary.

Germination: Usually slow; protect well from outside interference during the long germination period and be patient.

Comments: More needs to be learned to improve the germination/propagation success of this plant.

***Endiandra pubens* (Hairy walnut)**

Description: Large (to 5-6 cm in diameter) round, red, sparsely ribbed fruit containing a single large seed.

Time: Summer

Method: Prise seed from fruit and soak to remove all flesh. Crack seed coat in vice, but gently so that seed itself does not break apart. Put into a deep, narrow pot to allow room for, and encourage, good root development.

Germination: Usually very slow, perhaps up to several months, but roots develop well ahead of shoots so be patient.

Comments: Slow to propagate from seed and cuttings, but worth the effort.

***Eupomatia laurina* (Bolwarra)**

Description: To about 2cm, yellow/green, round berry with a flattened, ridged top containing many tiny seeds within an edible, sweet-tasting clear pulp.

Time: Late autumn/winter

Method: Wash seed and sieve pulp. Sow immediately, making sure seed is lightly but thoroughly covered..

Germination: Slow – may take anything from 1 to 6 months but usually germinates eventually.

Comments: Can be frustratingly and unpredictably slow as perfect seeding conditions are

not well understood. Warm, humid weather (min. 25 degrees C) may be required to initiate germination.

FIGS (*Ficus* spp.)

Remove seeds with teaspoon or similar small implement. Mix in with some clean river sand to spread them apart. Sow seeds from one fig into one punnet cell, or split them up if scarce. Fruit is usually so abundant it pays to over-sow to ensure germination. Seedlings can always be thinned out when they are still small.

Use seed from ripe fruit; so it's important to know colour of mature fruit, e.g. purple with *F. macrophylla*, brown-orange with *F. fraseri* etc. Also note that fruiting times are approximate – some fruit may appear at any time of year.

***Ficus coronata* (Creek sandpaper fig)** – Round, turning purple-black at maturity.
December - March

***Ficus fraseri* – (Sandpaper fig)** Ovaloid with small “crown” at top end. Yellow turning to orange-brown at maturity. December – February.

***Ficus macrophylla* (Moreton Bay Fig)** – Larger than the other figs, rounded with typical fig “nipple”, purple at maturity with white spots. February-May

***Ficus obliqua* – (Small-leaved fig)** - Rounded, yellow-turning-orange/red. March - June

***Ficus superba* var. *henneana* – (Deciduous fig)** - Round, yellowish-green with spots and reddish ends, turning purple. November – January.

***Ficus watkinsiana* – (Watkins fig)** - Ovoid, purplish-black with white spots like *F. macrophylla* but smaller and usually in pairs. September – April.

Flindersias

The four species of *Flindersia* native to Tamborine Mountain all have woody capsules containing 10 – 15 papery winged seeds that are easy to propagate.

***Flindersia australis* (Crow's Ash)**

Description: Brown prickly capsule 7-10cm long breaking into five boat-shaped segments at opening.

Time: Autumn to spring

Method: Sow directly into growing medium without treatment; cover very lightly

Germination: 2 -3 weeks

Comments: Keeps for about 7 days in a cool, dry place

***Flindersia bennettiana* (Bennett's Ash)**

Description: Similar to *F. australis* but lacking prickles and slightly smaller (to 8cm)

Time: November to February

Method: As for *F. australis*

Germination: 2 – 4 weeks

Comments: Keeps for about 7 days; perhaps longer at about 5°C

***Flindersia schottiana* (Bumpy Ash)**

Description: Similar to *F. australis*
Time: January to March
Germination: Same as *F. australis*

***Flindersia xanthoxyla* (Long Jack, Yellow wood)**

Description: Similar to *F. australis* but darker in colour
Time: Winter to early spring
Germination: Same as *F. australis*

***Glochidion ferdinandi* (Cheese tree)**

Description: A red (when ripe, otherwise very pale whitish green), ribbed capsule that looks like a tiny Dutch cheese
Time: April - September
Method: Remove seed from ripe fruit as soon as it splits and plant immediately.
Comments: Can be propagated from cuttings. Seed stores for several months.

***Mallotus claoxyloides* (Green Kamala)**

Description: Small brown capsule with spikes all over the surface (looks a bit like an old-fashioned landmine), splitting into 3 (sometimes only 2) segments containing the same number of grayish seeds.
Time: February – March (or later in some areas/some years)
Method: Clean fresh seed lightly in warm, soapy water and sow.
Germination: Six weeks to six months
Comments: May be a bit slow to start. Also, once the capsules split the seed scatters so best to collect capsules just before they open. Cuttings are hard to strike.

***Mallotus discolor* (White or Yellow Kamala)**

Description: Small (5 – 6mm diameter) yellow-to-orange capsule with 2 – 4 segments containing same number of seeds.
Time: November - December
Method: As for *M. claoxyloides* – sow within a week
Germination: Very erratic and may be slow
Comments: Patience needed with germination. Can be propagated from tip or softwood (semi-ripe) cuttings

***Mallotus philippensis* (Red Kamala)**

Description: Dull reddish, ridged, powder-coated capsules with, usually in 3 segments

containing a black seed in each.

Time: September to December

Method: Remove seed from capsule, wash lightly in a sieve

Germination: Erratic – may take a couple of weeks, may take several months

Comments: Non-viable and slow-to-germinate seed is a problem – but worth trying

***Rubus rosifolius* (Wild raspberry)**

Description: Typical raspberry; red fruit with lots of tiny seeds

Time: Usually October – December, sometimes a bit longer

Method: Soak ripe fruit in water, mashing it so that the seeds can float free. Leave overnight, by which time seed should have dropped to the bottom of container, with fruit pulp floating on the surface. Another method is to rub fruit through a sieve and mix seed with dry sand. Place in cell punnets or flat seed trays.

Germination: At least three months

Comments: Though slow to germinate the seed from ripe fruit is usually successful – just be patient. Cuttings may be a faster and easier way to propagate – more on this later. Other raspberry types can be similarly treated and germinated.

***Sloanea woollsii* (Yellow Carrabeen)**

Description: One or two shiny black seeds encased in a red aril and born in a prickly, capsule that opens into two segments. NOTE: Though sources generally indicate two seeds per capsule, Tamborine Mountain trees seem often to produce capsules with only one seed.

Time: March - July

Method: If capsule is already opening, prise apart and remove seeds. If not, cut very gently LENGTHWISE (the length of the capsule is slightly longer than the width), enough to open the capsule but not damage the seed within. Remove the seed and sow immediately in a fine mix (eg commercial seed-raising mix).

Germination: 4 – 6 weeks (perhaps earlier in warm, wet conditions)

***Syzygiums* (Lilly pillies)**

Many species of lilly pillie are found on Tamborine Mountain and all are quite easy to propagate if good, uninfected fruit is available. This is best picked straight off the tree when ripe but as fruit on larger trees is hard to get, seed can be collected from the ground if it is recently-fallen and free from parasite infection. Soak for 24 hours to be sure of drowning any unwanted critters, then remove seed from outer flesh before sowing. Sow all lilly pillie seeds as soon as possible after collection as viability period is very short.

***Syzygium crebrinerve* (Purple Cherry)**

Description: Round, slightly flattened, 15 - 25mm purple fruit with calyx making a small “crown” on top.

Time: Late summer - autumn

Germination: Though this species is important to our regeneration projects it is VERY slow to germinate – up to 12 months or more. Also, it's very hard to find fruit that isn't damaged by insects.

***Syzygium australe* (Brush cherry)**

Description: Single seed inside a pink to deep red pear-shaped fruit

Time: Summer

Method: as for *Acmena smithii* but be more thorough in peeling flesh from seeds

Germination: 3 - 8 weeks, depending on conditions

***Syzygium* (formerly *Acmena*) *smithii* (Lilly Pilly)**

Description: single seed inside a rounded, fleshy berry that ranges in colour from white to mauve-pink.

Time: Autumn to winter

Method: Remove seed from outer flesh and clean thoroughly.

Germination: 4 to 8 weeks.

Comments: Seed can be stored for a few weeks if thoroughly cleaned, sterilized and dried. This plant can also be easily grown from cuttings during spring and summer