PART 2

LEARNING THROUGH EXPERIENCE

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Maximum Diversity Method
- Site preparation
- Planting
- Maintenance

Natural Regeneration Method
Riparian Revegetation
- Site preparation
- Planting
- Maintenance

GROWING YOUR OWN TREES

Seed Collection
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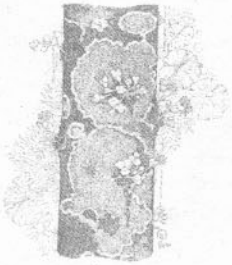
Where to from here



LEARNING THROUGH EXPERIENCE

The practical difficulties of reconstructing an entire ecosystem are enormous. Hopkins (1981) has indicated it may take up to 800 years for a fully mature rainforest to re-establish. Given our lack of understanding of the ecology of the Wet Tropics, it is hardly surprising that even less is known about how to rehabilitate it. However, over the years a number of determined people including researchers, national park rangers and community groups have been trialling rehabilitation techniques. Together, their experiences create an indispensable store of information on the practical steps of re-establishing rainforest.

Soil loss and erosion during road construction has exposed roots, eventually killing the trees and destabilising the bank.

Planning for a rehabilitation project must firstly recognise and assess the factors which limit the re-establishment of native vegetation. These are usually a reflection of human disturbance. The methods adopted to overcome this disturbance will, to a large extent, depend on the frequency and intensity of these disturbances over time. The importance of planning can not be overstated as a critical step in the success of any rehabilitation project.

Why doesn't it just grow back?

Soil loss and disturbance

Which results from climatic variables (wind, water, sun) and unsustainable land use practices.

Loss of soil fertility

Which occurs through disruption to biogeochemical cycles. On the Atherton Tablelands, Maggs and Hewett (1993) found lower levels of calcium and nitrogen in rainforest derived pasture grassland soils than in adjacent rainforest soils. Regrowth (secondary) forests yielded nutrient levels between those of grassland and rainforest.

Absence or lack of material for propagation

Which are either seeds existing in the soil seed bank (Hopkins, 1990) (Tucker and Mair, 1994 unpublished) or root stumps which could resprout.

Reduction or loss of symbiotic mycorrhizal fungi

Which assist in plant nutrient uptake (Miller, 1987).

Site dominance by aggressive woody weeds, vines and pasture grasses

These include native and exotic (non-native) species which arrest or deflect the natural succession process and often make an area susceptible to fire. The most common agressive species in Far North Queensland are:

Brachiaria decumbens	Signal Grass
Cinnamomum camphora	Camphor Laurel
Glycine tomentosa	Glycine
Imperata cylindrica	Blady Grass
Lantana camara	Lantana
Ligustrum spp	Privets
Melinis minutiflorum	Molasses Grass
Panicum maximum	Guinea Grass

Rubus moluccanus	Giant Bramble
Spathodea campanulata	African Tulip
Thunbergia grandiflora	Blue Thunbergia
Tithonia diversifolia	Japanese Sunflower
Turbina corymbosa	Turbina

Large areas of cleared land

Which occur between the rehabilitation site and the nearest patch of native vegetation.

The greater the distance the less likely it is that the site will receive seed inputs from adjacent native vegetation (Parrotta 1992, Robinson and Handel 1993).

Alteration of hydrological processes

In the Wet Tropics of Far North Queensland this has taken two main forms:

(i) the clearing of all streambank vegetation often leading to serious erosion on most rivers such as the Daintree, Barron, Mulgrave, Russell, Tully and Herbert, and siltation problems in smaller streams particularly on the south-eastern Atherton Tableland and East Palmerston areas, and

(ii) the construction of artificial drains in wetland areas (principally in the sugar growing areas of the coastal lowlands) leading to the loss of various communities including native grasslands, paperbark forests (*Melaleuca* spp.), feather/fan palm communities and complex mesophyll vine forests

Stock grazing inside and around the margins of rainforest patches

Stock contribute to soil compaction which alters run-off patterns, damages tree roots and makes seedling regeneration more difficult. They also graze on seedlings. Where stock use the interior of a rainforest remnant for shelter these factors are quite noticeable and may put small remnants at serious risk.

Restrictions imposed by adjacent land uses

In the interests of safety, potentially large rainforest species should not be planted near buildings or where they may interfere with any essential services.

The influence of fire

Rainforests are intolerant of fire (Adam 1992). Fire has a number of serious effects including reducing seed germination rates and soil flora/fauna populations (Mabberley 1992). Burnt areas are frequently colonised by fire- tolerant grasses such as Blady Grass *(Imperata cylindrica)* and Molasses Grass *(Melinus minutiflora)* which maintain and promote this fire susceptibility. The hillsides around Cairns city are a good example of this fire-induced (disclimax) grassland.

Rainforest destroyed by fire on the coastal plain near Tully

Most sites show combinations of these limiting factors. Recognising and understanding the effects each of these factors has on the site is important in planning its rehabilitation.

Lantana and African Tulip, two common weeds of the Wet Tropics

Trees for Farms

Many mutual benefits can accrue from integrating conservation and agriculture. Whole farm planning is encouraged by all government land management agencies and they are keen to give planning advice. There are tax benefits available to primary producers who undertake many of these activities. Tree planting is recognised as an essential element in controlling land degradation and your accountant should be aware of the regulations relating to these incentives.

On dairy farms native vegetation can provide shade and shelter. In a study at the Kairi Research Station in Far North Queensland, Silver (1987) found dairy cattle with access to tree shade produced on average 1.45 litres more milk/cow/day than their unshaded counterparts. This increased to 2.2 litres more milk/cow/day during the hottest week of the eight week trial. Better milk quality and reduced heat stress were also noted.

On dairy farms native vegetation can provide shade and shelter.

Trees can also be used for erosion protection and as a fodder source. By examining the design of the farm and the farm's position on the landscape, these plantings can serve as stepping stones or even corridors between adjacent habitat patches.

Trees can also serve as a windbreak. Research has shown that dense, impermeable windbreaks are most suitable for livestock and buildings. More open windbreaks offer better protection to crops and pastures (Breckwoldt 1983).

In coastal cane districts, trees can help control riverbank and cane drain erosion. Additionally, many cleared streambanks and headlands offer good habitat for the Cane Rat *(Rattus sordidus)*, a species which costs the Queensland cane industry $5 million per year (P. Storey, pers. comm.).

Wilson and Whisson (1989) recommended revegetating these streambanks as part of a cane rodent control strategy and early results suggest the impacts on cane rodents are very promising.

Fences

Installing fences to exclude stock can be a very cost-effective rehabilitation technique. Fencing around degraded remnant patches may be all that's required to promote natural regeneration. Newly planted areas and creek lines may also benefit from fences.

METHODS

Methods of rehabilitating rainforest vary in terms of site location, species selection and the intensity of management. Four broad methods can be defined:

1. The Framework Species Method
2. The Maximum Diversity Method
3. The Natural Regeneration Method
4. Riparian Rehabilitation.

1. The Framework Species Method

This method involves establishing a single species or group of species which can be considered ecosystem building blocks. They are typically species of the pioneer and mid-successional stages of plant community development. Some mature phase species can be included if they grow rapidly or provide important food resources for wildlife.

Many of these species are common along rainforest margins and in close proximity to isolated trees and structures such as fencelines. Their seeds are most commonly dispersed by birds. The purpose of the Framework Species Method is to establish them as a 'bait crop' to entice birds to the rehabilitation site to deposit seeds from adjacent forests. The modified microclimate established under the bait crop helps seeds to establish.

The principal advantages of this method are:

- it involves only one planting
- it is a self-sustaining approach which relies on the local gene pool to increase species and life form diversity.

The principal disadvantage of the method is it relies on native vegetation being close enough to provide a seed source. For this reason the method is best for extending existing rainforest, establishing new plots or buffers adjacent to existing forest remnants, establishing stepping stones, and for rehabilitating protected areas (crown land reserves).

Selecting the right species

Species used in the Framework Species Method are selected on the basis of the following features:

Toughness

The plant's ability to withstand harsh conditions including full sun, wind, floods, droughts and depleted or disturbed soils. Plants exhibiting all these features are hard to find!

Attractiveness to wildlife

Ideally, the foliage, flowers and fruit should attract a wide range of invertebrates (pollinators, decomposers) and vertebrates (consumers, dispersers).

Regenerative ability

Species with 'robust' germination mechanisms can contribute to habitat expansion across the landscape via dispersal agents such as pigeons.

Early production of wildlife resources

Species which can be relied upon to produce flowers and fruit from an early age (2 - 5 years), and on a regular and reliable basis are valuable for rehabilitation.

Plants used in the Framework Species Method should be attractive to a wide range of pollinators and dispersal agents such as this Queensland Blossom Bat.

Pioneer species Bleeding Heart

Keystone species (Gilbert 1980)

Howe (1990) describes these as 'trees that provide critical resources during annual periods of fruit scarcity' which 'may support a variety of frugivores that disperse seeds of many other plant species at other times of the year'.

Deciding which Far North Queensland plants are keystone species needs further investigation, though figs (*Ficus* spp.) are likely to be prominent (Mabberley 1992, Terborgh 1986, also Innis 1989).

Architecture

Species with thicker crowns provide more effective shade, restricting grass competition and woody weed establishment.

Vigour

Species with rapid growth rates can quickly create a microclimate which cools soil, encourages natural regeneration and suppresses weeds.

Ease of germination

Nursery propagation of the chosen species should be easy or at least reliable.

Species with limited dispersal mechanisms

Large-fruited species such as Queensland Walnut *(Endiandra palmerstonii)* or Bumpy Satinash *(Syzigium cormiflorium)* may rely on the Cassowary for their dispersal. With the loss of this bird from many fragmented forests, human intervention may be needed to reintroduce these species to areas of their former range.

Why pioneers?

Pioneer species are important to the Framework Species Method for a number of reasons:

- Their rapid growth suppresses weeds and forms a microclimate beneath the plant.
- Their ability to flower and fruit from a very early age provides food for wildlife.
- They rapidly contribute to leaf litter, humus build-up and the re-establishment of nutrient cycles. Preliminary studies indicate leaf litter invertebrates (important in litter decomposition and nutrient recycling) have increased in diversity over time in rehabilitation plots at Lake Barrine National Park and most of this litter was contributed by pioneers (Rogers 1993, unpublished).
- As the short-lived pioneer species die and fall they create light gaps, assisting the lateral growth of adjacent plants and the upward growth of regenerating seedlings. The fallen logs and branches create a ground storey habitat for wildlife.
- Their fast growth rates increase the vertical growth of adjacent slower growing species. This may have an effect on the future structure of the new forest by ensuring these slower growing species reach their full potential height and structural capacity.
- Many of the birds which feed on these species can travel across the open areas between patches of native vegetation (Fleming et al 1987; Date et al 1991).

If you decide to use the Framework Species Method, pioneer species should comprise 30% of the total planted.

Using this method, natural regeneration generally begins within two years of plot establishment. The tables overleaf show this natural recruitment in two Queensland Department of Environment and Heritage (QDEH) rehabilitation plots at Lake Barrine National Park and Eubenangee Swamp National Park. Both plantings are adjacent to existing forest.

The tables indicate the extra diversity which can be expected. With the exception of Bleeding Heart (*Omalanthus novo-guineensis*) in the Eubenangee plot, none of these seedlings are offspring of seedlings originally planted in the plots.

Once this natural regeneration process is underway some pioneers could be ringbarked and allowed to decompose naturally. Be warned, natural regeneration often includes undesirables such as Lantana (*Lantana camara*), Brambles (*Rubus* spp.), Camphor Laurel (*Cinnamomum camphora*) and African Tulip (*Spathodea campanulata*). These should be removed as soon as they appear.

Table 1: Naturally recruited species in 10-year-old 200sq.m rehabilitation plot established June 1985 at Eubenangee Swamp National Park, Far North Queensland.

Family	Genus/Species	Common name
Annonaceae	*Melodorum uhrii*	Zig-zag Vine
Apocynaceae	*Melodinus australis*	Vanilla Vine
Araceae	*Gymnostachys anceps*	Settler's Vine
Araliaceae	*Polyscias australiana*	Ivory Basswood
Arecaceae	*Archontophoenix alexandrae*	Alexander Palm
	Calamus motii	Yellow Lawyer Cane
Asclepiadaceae	*Ichnocarpus sp. (syn. Tylophora)*	(vine)
Clusiaceae	*Garcinia warrenii*	Native Mangosteen
Combretaceae	*Terminalia sericocarpa*	Damson Plum
Dilleniaceae	*Dillenia alata*	Red Beech
	Hibbertia scandens	Snake Vine
Euphorbiaceae	*Breynia stipitata*	Coffee Bush
	Glochidion sumatranum	Buttonwood
	Omalanthus novo-guineensis	Bleeding Heart Tree
	Mallotus polyadenos	Kamala
Fabaceae	*Pongamia sp. (=RFK/3295)*	Pongamia
Flagellariaceae	*Flagellaria indica*	Supplejack
Lauraceae	*Beilschmiedia obtusifolia*	Blush Walnut
	Cryptocarya grandis	Cinnamon Laurel
	Cryptocarya murrayi	Murray's Laurel
	Cryptocarya triplinervis	Brown Laurel
Leeaceae	*Leea indica*	Bandicoot Berry
Lygodiaceae	*Lygodium microphyllum*	(vine)
Menispermaceae	Unidentified	(vine)
Monimiaceae	*Tetrasynandra laxiflora*	(vine)
Moraceae	*Ficus congesta*	Fig
	Malaisia scandens	(vine)
Myrtisticaceae	*Myristica insipida*	Nutmeg
Papilionaceae	*Derris trifoliata*	(vine)
Piperaceae	*Piper novo-hollandiae*	Pepper Vine
Proteaceae	*Cardwellia sublimis*	Northern Silky Oak
	Helicia nortoniana	Norton's Silky Oak
Rhizophoraceae	*Carallia brachiata*	Carallia
Rubiaceae	*Randia fitzalanii*	Brown Gardenia
Rutaceae	*Melicope elleryana*	Evodia
	Zanthoxylum ovalifolium	Thorny Yellowwood
Sapindaceae	*Guioa acutifolia*	Glossy Tamarind
	Rysotoechia flavescens	Tuckeroo
	Mischocarpus exangulatus	Rex Tokoonja
	Mischocarpus lachnocarpus	Woolly Brush Apple
	Synima macrophylla	Synima
	Toechima erythrocarpum	Pink Tamarind
Sapotaceae	*Planchonella brownlessiana*	Boxwood
	Planchonella chartacea	Planchonella
	Planchonella obovoidea	Yellow Boxwood
Smilacaceae	*Smilax australis*	Austral Sarsaparilla

Symplocaceae	*Symplocos cochinchinensis*	White Hazelwood
	ssp. thwaitesii	
	var. pilosiuscula	
Verbenaceae	*Gmelina fasciculiflora*	White Beech
	Premna serratifolia	Creek Premna
Xanthophyllaceae	*Xanthophyllum octandrum*	Macintyre's Boxwood

Table 2: Naturally regenerating species in a seven-year-old 200 sq.m revegetation plot established April 1988 at Lake Barrine National Park

Family	Genus/Species	Common name
Anarcardiaceae	*Euroschinus falcata var. falcata*	Pink Poplar
Apocynaceae	*Alstonia muelleriana*	Hard Milkwood
	Melodinus australis	Vanilla Vine
Araliaceae	*Polyscias elegans*	Celerywood
	Schefflera actinophylla	Umbrella Tree
Arecaceae	*Calamus motii*	Waitawhile
Dilleniaceae	*Tetracera nordtiana*	Fire Vine
Elaeagnaceae	*Elaeagnus triflora*	Millaa Millaa Vine
Elaeocarpaceae	*Elaeocarpus largiflorens ssp.* largiflorens	Tropical Quondong
Euphorbiaceae	*Aleurites moluccana var. rockinghamensis*	Candlenut
	Mallotus mollissimus	Kamala
	Mallotus philippensis	Yellow Kamala
	Glochidion sumatranum	Buttonwood
Meliaceae	*Aglaia sapindina*	Boodyarra
	Dysoxylum muelleri	Miva Mahogany
	Toona ciliata	Red Cedar
Menispermaceae	*Stephania japonica*	Stephania
Mimosaceae	*Parachidendron pruinosum*	Baconwood
Monimiaceae	*Wilkea sp.*	Wilkea
Myrtaceae	*Syzygium sayeri*	Pink Satinash
Oleaceae	*Olea paniculata*	Native Olive
Piperaceae	*Piper novoe-hollandiae*	Native Pepper
Rhamnaceae	*Alphitonia whitei*	Sarsaparilla
Rutaceae	*Flindersia brayleyana*	Queensland Maple
	Melicope elleryana	Butterfly Tree
Sapindaceae	*Arytera divaricata*	Rose Tamarind
	Castanospora alphandii	Brown Tamarind
	Guioa lasioneura	Tamarind
	Harpullia pendula	Tulipwood
	Mischocarpus lachnocarpus	Woolly Brush Apple
Urticaceae	*Dendrocnide photinophylla*	Mulberryleaf Stinger
Zingiberaceae	*Alpinia caerulea*	Ginger

2. The Maximum Diversity Method

As the name suggests this method attempts to recreate as much as possible of the original (pre-clearing) diversity. Mature phase canopy species form the bulk of these plantings and pioneer species are generally ignored.

The method is well suited to smaller plantings where more intensive management is possible, and for areas isolated from any native vegetation which could provide seeds. In the absence of native seeds, these isolated plantings frequently attract many woody weed species and diligent maintenance is required to eradicate these undesirables. For this reason it is recommended for some urban situations (council parks and gardens, golf courses) and 2 - 5 ha blocks in rural residential areas which were once productive agricultural land. Many of these blocks are used for little more than ride-on mower practice and strategic planting of parts of them would show positive benefits for nature conservation. The principle here must be to ensure plantings do not interfere with the provision of essential services (electricity, reticulated water, etc.) or pose problems for neighbours. Residents of smaller town blocks may wish to consult their local nursery for advice on appropriate species. Many smaller rainforest species are eminently suited to garden cultivation. Because this method is suited to areas close to human settlement, extra attention can be paid to species with attractive flowers, fruit and foliage.

The principal disadvantage of this method is the intensive maintenance required because of the slower growth of many mature phase species. This results in increased labour commitment and the need for follow-up plantings to establish those species intolerant of high light intensities or exposure.

Once you have chosen either the Framework Species Method or the Maximum Diversity Method as most appropriate for your situation, it's time to think about site preparation.

Site Preparation

Site preparation will be dictated by the site's disturbance history. If an area has been heavily grazed by stock over a long period or mowed every week with the ride-on mower, it will almost certainly need to be deep ripped. Ripping helps water infiltrate the soil and helps the new plants establish a vigorous root system. Rip to a depth of 200 - 300mm following the contour of any slope. Ripping on steep slopes should be avoided. Long abandoned pasture may only need to be slashed and sprayed or mulched. River and creek flats should not be deep ripped.

Following ripping, or if ripping is not needed, either mulch the area or spray the weeds as they appear. The newly germinated weeds are often ephemerals such as Blue Tops (*Ageratum* spp.) or Thistles (*Sonchus* spp.). Ensure regular monitoring of the area because the weeds will enjoy the new conditions as much as the potential tree stock. Always spray just before or at the onset of flowering to ensure good translocation of the herbicide and to stop the plant producing another generation of weed seed.

Blanket spraying involves applying herbicide to kill all grass and woody weeds prior to planting. This eliminates competition for moisture and nutrients and allows the dead plant material to act as a mulch. The depth of this valuable mulch layer can be increased by slashing the area 2 -3 times before spraying. This has the added advantage of promoting new growth on the weeds, providing a better target for the herbicide.

Non-residual herbicides - that is glyphosates such as 'Roundup' - should always be used. Final spraying can be completed 1 - 2 days prior to planting. Advice on the treatment of weeds not affected by glyphosates can be obtained from your local office of the Rural Lands Protection Board.

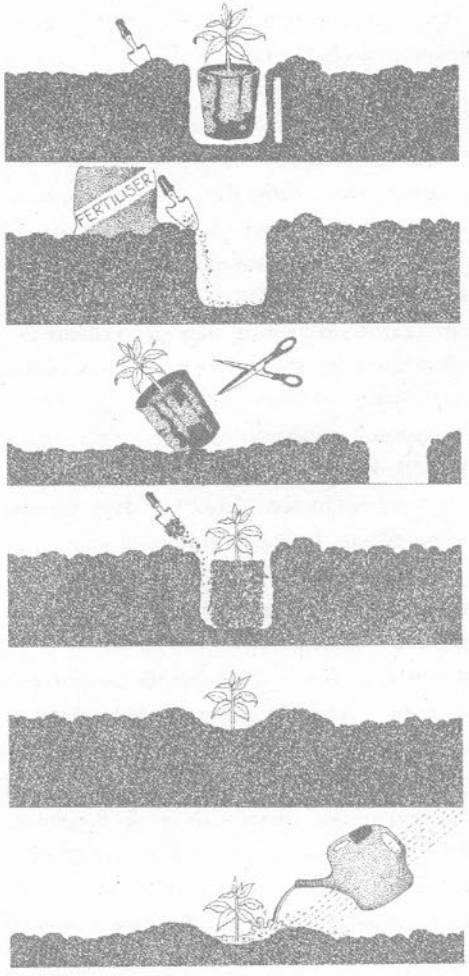
If herbicides are not acceptable, regular and heavy applications of mulch (following ripping, slashing or other manual control) can be used to control weeds. Mulching is recommended as part of the preparation process to retain moisture, cool the soil and 'kickstart' nutrient cycling. Hay bales, cardboard or bagasse are all acceptable mulches. A particle mask should always be used when spreading bagasse and hay to avoid breathing in the fibres or mould spores.

Many species incorporated into Maximum Diversity Method plantings have little tolerance for conditions resulting from soil degradation. For this reason site preparation will involve deep ripping and mulching in most instances. In small areas where large machinery is impractical, smaller ground-breaking equipment should be used.

Supply of water to the site is essential for Maximum Diversity Method plantings. This would ideally involve installing a tap or pump and an overhead or spray sprinkler system. Framework Method species generally show more tolerance to drier conditions.

Ideally all site preparation should take place in late winter or early spring so that planting may begin when summer rains arrive. Good site preparation equates with 3 - 6 months extra growth.

HOW TO PLANT:



1. Check the hole for depth

2. Put fertiliser in the bottom of the hole, mix with soil and cover

3. Remove the bag by cutting along one side

4. Place the plant carefully in the hole and fill in

5. Form a saucer around the stem to save water

6. Water in well or plant when it is raining

The Framework Species Method relies on adjacent native vegetation and replanting should start as close as possible to this existing vegetation. The existing trees will provide some buffering against insect attack and some protection from the elements.

Planting

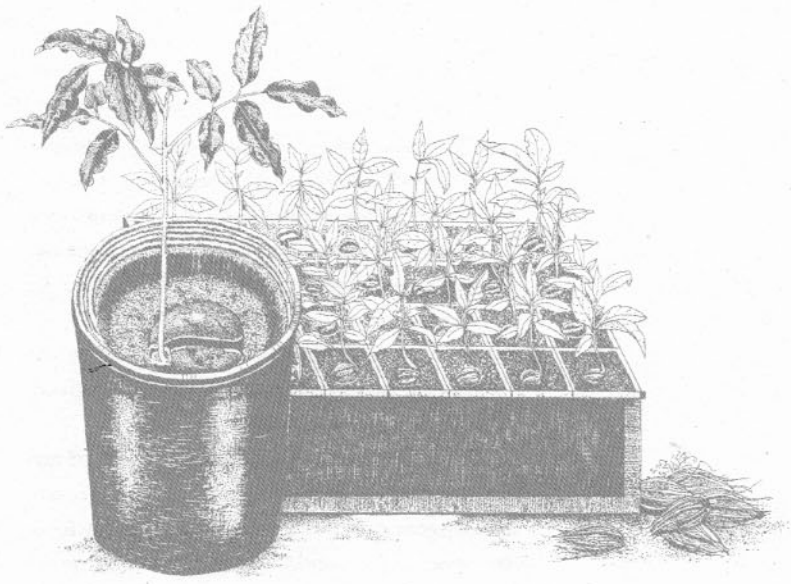
'The right tree in the right place at the right time for the right reasons' (J.G. Tracey, 1984)

Planting is generally the quickest and most satisfying part of the job, but don't forget the time and money invested in seedling stock, site preparation and maintenance. Utmost care should be taken to ensure plants are successfully established. All plants should be 'hardened off' in full sun at least a month before planting.

In general, trees should be planted at random 1.5 - 1.8m spacings, avoiding straight lines. Staking plants leads to weak stems and should be avoided at all times. If it falls over trim the plant, starting at the top and working down, until it stands up by itself.

Rainforest species should be around 500 - 600mm high at planting. Sclerophyll species - that is *Eucalyptus* spp (gums) and *Acacia* spp (wattles) - should be 200 - 300mm tall at planting. Pioneers should also be around 300mm tall.

While many local species are very tolerant to adverse conditions, sufficient water is still critical for their successful establishment. Immediately after planting, provide at least ten litres of water to each tree to expel air pockets and settle the roots against the soil. The need to continue watering can be alleviated by planting with the onset of good summer rain. Notable exceptions to this rule are sites which are prone to frosts or floods. On frost-prone sites water should be made available and trees planted early in spring. This gives plants time to develop a woody stem which can resist frost or allow the plant to sucker from the base following frost damage. Planting flood-prone sites is discussed in 'Riparian Revegetation'.



Using the Maximum Diversity Method, Kooyman (pers. comm.) has found that the faster growing species form the canopy and the slower, shade tolerant species persist until a suitable light gap is formed allowing them to climb towards the canopy. As a canopy forms, other light sensitive species can be planted into spots where failures have occurred. Generally, spacings of 1.5m are recommended for this method.

This theme can be varied by including some pioneer species (10%) at the time of planting. These are allowed to persist for 12 - 24 months, providing cover for light sensitive species, and are then felled. Felled trees should remain on the site to provide additional mulch. Light sensitive plants such as Nutmeg *(Myristica insipida)*, Gingers *(Alpinia* spp.) and ferns can then be planted in the new gaps.

The branches of these pioneers can be used to provide 'lean-to' covers over adjacent trees in the plot to buffer them from the sudden exposure of a canopy gap. Felling pioneers during extended cloudy or wet periods alleviates the risk of sudden exposure and co-incidentally, it is a good time for enrichment planting.

Whitmore (1992) notes that mature phase species grown in botanical parks and other open situations rarely reach the heights of their native community counterparts. Most local rainforest species also develop a lower, more bushy habit when grown in the open, a response to the extra light available in these conditions. The methods described here emphasise close spacings to achieve a rapid structure and trees are thus more likely to achieve greater height. Due to the potential height of many rainforest species, their use close to buildings or power lines should be avoided.

In the rainforest, leaf litter does not fall in neat circles around and away from the stems of seedlings, and the same philosophy should apply to mulching planted rainforest seedlings. Mulch should completely cover the ground and be thick enough to suppress weed regrowth. Only in the case of dryland species should mulch be kept away from the stem base. Dryland species are not recommended for planting in former rainforest areas just as rainforest species are not recommended for dry areas. Plant the species which naturally occur in your immediate area.

To make plantings more attractive to other wildlife, try providing some hollow logs or pipes of different shapes and sizes for lizards, frogs and small mammals to colonise. Artificial nesting and resting boxes will make the planting more attractive to birds and possums. Appropriate measures may be needed to control the effects of both feral and domestic cats and dogs.

Maintenance

Whatever the method, the aim of all maintenance is to exclude undesirable species to the greatest possible extent. Many tree plantings are lost, or severely set back, because of a lack of follow-up maintenance and subsequent choking by weeds. **Invading weeds must be sprayed or grubbed/mulched-out** and this should continue until the increasing leaf litter or low light levels naturally suppress weeds. Begin spraying or mulching around the trees as soon as weed regrowth appears, but be careful not to spray your seedlings. If this happens snip off the sprayed leaves or rinse with water. Mowing and brushcutting is not recommended for the following reasons:

- It encourages the growth and development of the grasses, merely controlling their vertical height but not their competitive root systems

- There is a risk of either damaging stems or cutting the plant down by trimming too close in the quest for neatness (Australian landscapes are wonderfully wild and unkept and the European gardening style should be avoided)
- Any fertiliser applied is intercepted by the grasses, increasing their competitive advantage over planted seedlings.

Fertiliser is an important component of any maintenance program. During the main growth season (generally November - April) apply fertiliser every four weeks, 200 - 300mm from the base of the plant. Organic fertiliser should be applied at 500 grams per plant and general purpose inorganic fertiliser at 100 grams per plant. You should begin fertilising when planting and stop after the second year.

Regular weed control means fertiliser is available only to the trees, resulting in rapid canopy closure. On the coastal lowlands the Framework Species Method achieves closure in 12 months while on the uplands closure is achieved in 18 months. After the canopy has closed, low light levels inhibit the establishment of most weeds.

The edges of these plantings will present the most maintenance problems due mainly to the extra light and the invading seeds of adjacent weed communities. Edges are best managed by maintaining a three metre buffer around the planting, either by slashing or spraying. This has the added advantage of providing a firebreak and a cleaner edge to start the next area of planting. Once the planting has reached its full extent, the margins can be closed off with vines such as October Surprise *(Faradaya splendida)*, Kangaroo Vine *(Cissus antarctica)*, Millaa Millaa Vine *(Elaeagnus triflora)* or the Wait-a-whiles (*Calamus* spp.).

Alternatively, bushy species from the Lillipilli and Satinash groups (*Acmena* spp., *Syzygium* spp.) or regularly pruned Cottonwood *(Hibiscus tiliaceus)* can be placed on the margin.

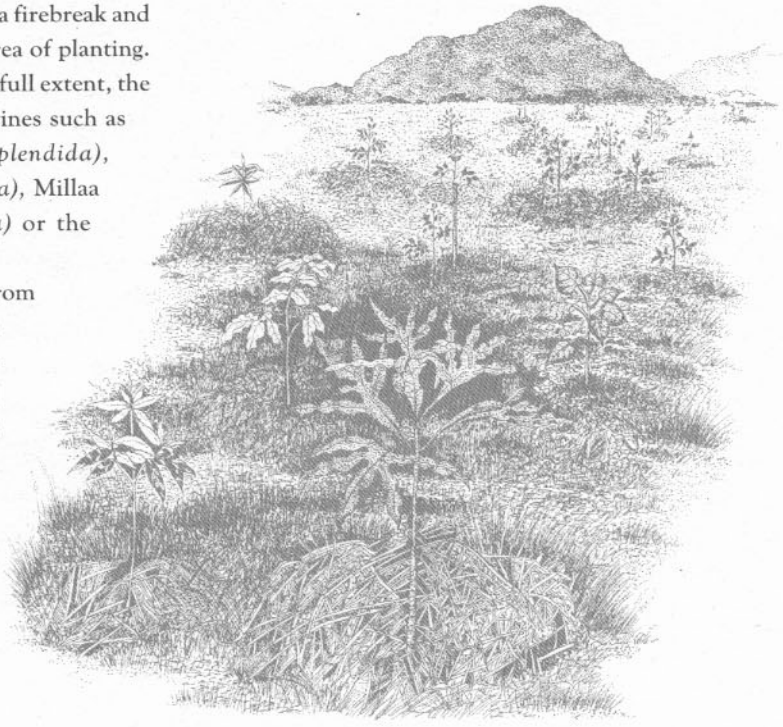
3. The Natural Regeneration Method

Relay succession involves the replacement of one plant community (or assemblage of species) by another in what is usually a gradual process (see Page 11). The Natural Regeneration Process manipulates this process, providing a way to accelerate succession. The method is suited to the management of existing margins or for stimulating regeneration close to existing forest.

Once the limiting factors of fire and grazing have been controlled by appropriate firebreaks and fencing, management is reduced to simply excluding weeds which are classified as noxious and must be removed according to government regulations.

Spraying margins infested with Lantana *(Lantana camara)* or Brambles (*Rubus* spp.) can be helpful because it:

- encourages the germination of native seeds in the soil seed bank
- allows better germination of seeds from existing trees (seed rain)
- releases those seedlings which have germinated under the weed cover. (The use of a herbicide wetting agent is not recommended in these situations.) Indications are that herbicide only has a minimal effect on small native seedlings existing under the weed canopy.



Mulch should completely cover the ground and be thick enough to suppress weed regrowth.

Before beginning any activity, examine the site carefully for any naturally regenerating seedlings which may already be present. Any native species existing amongst the weeds should be retained.

Seed production is strongly seasonal, generally taking place between October and March and peaking with the onset of the Wet. To take advantage of this seed production, it is important to carefully time any weed control. Initial treatment in early spring with a follow-up spray or mulch in early summer promotes a mulch layer and helps reduce the reproductive potential of weeds germinating from the soil seed bank.

Willson and Crome (1989), in a study at Wongabel State Forest in Far North Queensland, found seed rain (seeds dispersed by wind and vertebrates) extended up to 110m away from the forest edge. This study demonstrates the potential for regeneration to occur, once limiting factors have been overcome. In a study of soil seed banks along four north Queensland rainforest margins, Tucker and Mair (1994 unpublished) found very few of these seeds persist in the soil even 10 metres from the forest edge. This study suggests some grass control along margins would ensure seed rain accelerates the regeneration process. Weed control and natural regeneration also can be accelerated by planting pioneers in problem spots.

You can help natural regeneration occur further away from a margin or forest remnant by providing a resting perch for birds (McClanahan & Wolfe, 1993). These can take the form of either planted trees (preferably 'framework species') or a simple structure 2 - 3m above the ground which provides a safe perch. Fencing, weed control and fire management will be necessary around these perches.

4. Riparian Revegetation

Over the past decade the local community group TREAT (Trees for the Evelyn and Atherton Tableland Inc.) has worked hard to promote streambank revegetation and the results are visible throughout the region. In addition to their work, since the Wet Tropics was listed as a World Heritage Area in 1988, the shire-based Wet Tropics Tree Planting Scheme which employs displaced timber workers has replanted several kilometres of rainforests along stream banks in the region. Because of the extra moisture available, stream and riverside plantings frequently produce fast, positive results.

Recent Queensland legislation has recognised the environmental benefits of streambank vegetation by providing it with special protection under the *Water Resources Amendment Act 1993*.

Site Preparation

If stock graze the area, erect permanent exclusion fences and limit stock water access to sites where erosion and degradation can be minimised. These watering points should be gravelled to reduce erosion and provide safe access for stock.

Weed communities growing on cleared streambanks often include grasses such as Para Grass *(Brachiaria muticans)* and Guinea Grass *(Panicum maximum)*. These grasses are sometimes found in association with Giant Bramble *(Rubus mollucanus)* and Lantana *(Lantana camara)*. The exotic vines, Blue Thunbergia *(Thunbergia grandiflora)*, Turbina *(Turbina corymbosa)*, Balsam Pear *(Momordica charantia)* and *Clitoria laurifolia* are common invaders particularly on the coastal lowlands (Humphries and Stanton 1992).

Control all weeds before planting and leave the dead material on site. Most streambank weeds form a good mulch cover when killed, including Lantana which can be knocked down and broken into smaller pieces. Their roots continue to have some binding effect on the soil even after the plants themselves have been sprayed or mulched. Wherever practicable, use non-residual herbicides and avoid spraying into the watercourse.

Weeds on the site can also be manually controlled by cutting, grubbing out and mulching.

Planting

Planting should take place as soon as the sprayed weeds are yellowing and collapsing. In the case of manual weed control, planting should take place immediately. This takes advantage of the potential life of the mulch and the residual binding effects of the sprayed weeds' root systems.

Species for riparian revegetation are classified on the basis of two distinct zones: a community of waters' edge species, and those occurring further up the bank (and on the immediate flood plain area on the coastal lowlands). Appropriate species for these zones are detailed in the riparian species list at the end of this section.

Planting of waters' edge species should start 300mm above the average water level to about 2m above this point. These species are adapted to the rapid rise and fall of local watercourses and have anchoring root systems to help bind the soil.

All plantings should be on 1.5m spacings. This is to encourage quick canopy closure to intercept and reduce the size and velocity of individual rain droplets. Pioneer species are important for this reason and they should comprise 30% of the total number planted. Widely spaced trees with no mulch cover are likely to exacerbate the effects of soil erosion.

Timing is important with these projects especially on the coastal lowlands where slowly retreating floodwaters can often inundate seedlings for a period of weeks. While riparian species are adapted to this inundation, newly planted seedlings, especially pioneers, are still susceptible to both extended inundation and the sheer force of the floodwater and suspended debris. For this reason plantings on the coastal lowlands should be undertaken during April or May after the main flood season and while the prevailing south-easterly tradewind continues to bring moisture in from the ocean.

On the uplands, topography increases stream velocity but lessens the threat of lengthy inundation. With relatively permanent water close at hand, planting can take place any time between September and February. Frost-prone sites should always be planted earlier in the season to promote early establishment.

Maintenance

On these sites recolonisation by ephemerals is a genuine advantage because of the additional soil coverage and binding the new plants provide. However grasses, especially Guinea Grass (*Panicum maximum*), **must** be excluded at all costs either by spraying or manual grubbing. Fertiliser should be applied monthly during the November - March period.

Flood damage can be a problem for the first 2 - 3 years after establishment. Damage arises mainly from flood debris collecting on the plant and bending it over. After the flood recedes simply remove the debris and use it as mulch. Mulching with flood debris builds soil moisture and fertility and further protects against splash erosion.

Avoid straightening plants and staking them back up. Most riverbank species lean downstream and many are left prostrate after a flood. Coppicing (reshooting along the stem or from the base) is a common feature on these prostrate stems and in the longer term this is likely to reduce flood water velocity and provide good habitat for aquatic organisms such as fish and semi-aquatics such as Water Dragons.

Riparian Revegetation
Lowlands (eg. Miriwinni)

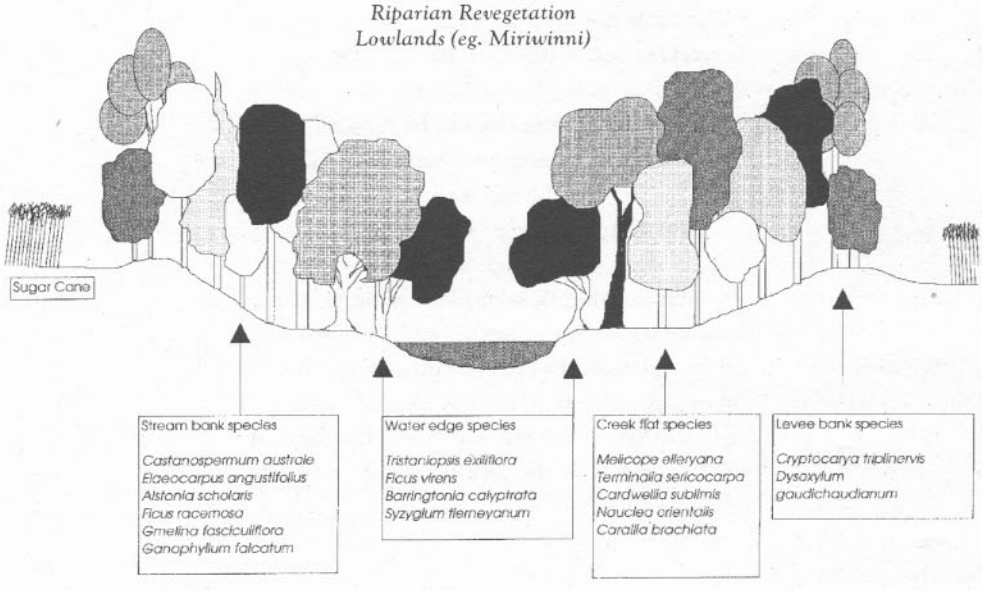


Table 3: Recommended Riparian Species

Key: **CL** Coastal Lowlands **FH** Foothills
U Uplands **AA** All Areas

Family	Species	Common	Location	Site Notes
Anacardiaceae	*Buchanania aborescens*	Buchanania	CL - FH	High banks, floodplains
Araliaceae	*Polyscias elegans*	Celerywood	AA	Pioneer, banks, flood-plains,
Arecaceae	*Archontophoenix alexandrae*	Alexander Palm	CL	Grows well in any moist situation, frost sensitive
Casuarinaceae	*Casuarina cunninghamiana*	River She-Oak	U - FH	Waters' edge species, frost resistant
Combretaceae	*Terminalia sericocarpa*	Damson Plum	AA	Banks, floodplains, good frugivore attractant, edible fruit
Cyatheaceae	*Cyathea cooperi*	Cooper's Tree Fern	U - FH	Grows in any moist situation, shoots back after frost
Dilleniaceae	*Dillenia alata*	Red Beech	CL - FH	Banks, floodplains, sandy/ swampy areas
Elaeocarpaceae	*Elaeocarpus angustifolius*	Blue Quandong	AA	Higher banks, floodplains, fast growing, frost sensitive
Euphorbiaceae	*Glochidion benthamianum*	Pin Flower Tree	CL - FH	Fast growing, bird attractant, banks, floodplain
	Glochidion harveyanum	Buttonwood	AA	Widespread, banks, floodplains, frost tolerant
	Glochidion phillipicum	Buttonwood	CL/FH	Banks, floodplains,
	Glochidion sumatranum	Buttonwood	AA	Banks, floodplains,
	Omalanthus novo-guineensis	Bleeding Heart	AA	Pioneer species, banks, floodplains
Fabaceae	*Castanospermum australe*	Black Bean	CL - FH	High banks, floodplains,
	Pongamia sp. RFK 3295 (syn. pinnata)	Pongamia	CL - FH	High banks, floodplains,
Lauraceae	*Beilschmiedia obtusifolia*	Blush Walnut	AA	Banks, floodplains, swampy areas,
	Cryptocarya hypospodia	Northern Laurel	AA	Banks, floodplains, adaptable
	Cryptocarya murrayi	Murray's Laurel	CL - FH	Banks, floodplains
	Cryptocarya triplinervis	Brown Laurel	AA	Banks, floodplains, bird attracting
Lecythidaceae	*Barringtonia acutangula ssp. acutangula*	Barringtonia	CL - FH	Any moist situation,
	Barringtonia calyptrata	Barringtonia	CL	Prefers permanently moist areas
Meliaceae	*Dysoxylum gaudichaudianum*	Ivory Mahogany	CL	Banks, floodplains,
Mimosaceae	*Acacia aulacocarpa*	Brown Salwood	AA	Pioneer species, frost resistant, banks and floodplains

Moraceae	*Ficus congesta*	Fig	AA	Waters' edge species, adaptable, widespread
	Ficus racemosa	Cluster Fig	AA	Banks, floodplains, fast growing,
	Ficus virens var. sublanceolata	White Fig	AA	Grows in any moist situation, important wildlife resource
Myrtaceae	Acmena hemilampra *ssp. hemilampra*	Blush Satinash	AA	High banks, swampy and sandy areas, frost tolerant
	Acmena smithii	Lilli-pilli	U - FH	Waters' edge, frost tolerant,
	Callistemon viminalis	Weeping Bottlebrush	U - FH	Waters' edge, frost tolerant, widespread
	Melaleuca leucadendra	Paperbark	CL - FH	Suitable for waters' edge, floodplains, swampy areas
	Syzygium angophoroides	Yarrabah Satinash	CL - FH	Grows in any moist situation, edible fruit
	Syzygium australe	Creek Cherry	U - FH	Waters' edge, edible fruit,
	Syzygium sayeri	Pink Satinash	AA	Banks, floodplains, frost tolerant
	Syzygium tierneyanum	River Cherry	AA	Waters' edge, edible fruit, frost sensitive
	Tristaniopsis exiliflora	Kanuka Box	AA	Waters' edge, prefers granite/metamorphic derived soils
Oleaceae	*Chionanthus ramiflorus*	Native Olive	CL - FH	Banks, floodplains, good frugivore attractant especially Torres Strait Pigeons
Pandanaceae	*Pandanus gemmifer*	Puppy Pandanus	AA	Grows well in any moist site, ideal waters' edge species
Rhizophoraceae	*Carallia brachiata*	Corkwood	CL - FH	Banks, floodplains, good frugivore attractant
Rubiaceae	*Nauclea orientalis*	Leichhardt Pine	CL - FH	Grows well in any moist situation
	Randia fitzalanii	Brown Gardenia	AA	High banks, floodplains
Rutaceae	*Melicope elleryana*	Corkwood	AA	Banks, floodplains, good bird/butterfly attractant
Sapindaceae	*Ganophyllum falcatum*	Scaly Ash	CL - FH	Banks, floodplains, edible fruit
Sapotaceae	*Planchonella obovoidea*	Boxwood	AA	Banks, floodplains, good frugivore attractant
Symplocaceae	*Symplocus cochinchinensis spp. thwaitesii var. pilosiuscula*	White Hazelwood	CL	Banks, floodplains,
	var. stawelli	White Hazelwood	AA	Banks, floodplains, frost tolerant,
Verbenaceae	*Gmelina fasciculifolia*	White Beech	AA	Banks, floodplains, frost tolerant

GROWING YOUR OWN TREES

Germinating and raising your own plants is easy, satisfying and cost-effective. Collecting the seeds from your local area leads to the benefits of having local plants which are best adapted to local conditions. Most Far North Queensland species germinate quickly and reliably, however a number are recalcitrant and sporadic. It is just not possible to describe germination techniques for every seed type occurring in the Wet Tropics Area. The following section details methods for germinating most species, particularly those in the lists provided. The times given for germination are averages.

Seed Collection

Having selected your site and decided on the appropriate species and methodology, you are ready to identify and locate potential seed trees. **It is illegal to collect any propagating material from within protected areas such as National Parks.** Trees growing in the open and in clumps on private land are often a good source. Always ask the owner before collecting on private land - most are willing to give permission when asked.

Regular monitoring of fruit development is essential to successful collecting. Partial ripening or seed fall generally indicates the crop is ready, unless an early seed fall has been brought on by a period of hot, dry or windy weather.

Where convenient, pick seeds directly from the trees. Fallen seed is quickly predated by rodents and insects who either totally consume or partially damage the seed. Keep your collections separate and labelled so you do not confuse species. Record the date and location of the seed for future collections or rechecking their identification later.

Seed Treatment

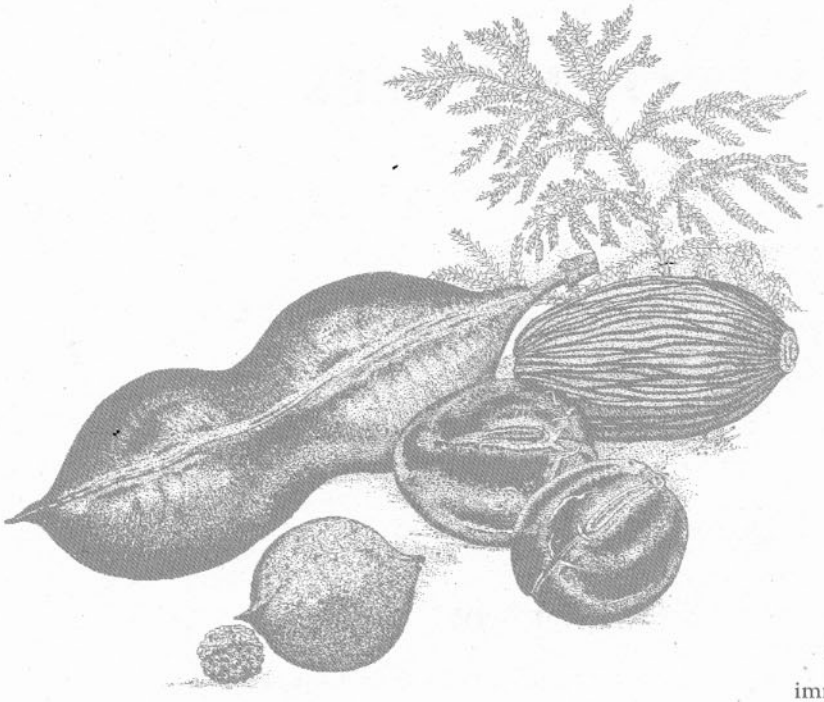
There is wide variation in seed types across the Wet Tropics Area and most require some form of treatment prior to sowing, generally to mimic those factors which promote germination in the wild and also to speed up the germination process. In most cases the only factor necessary for this germination is to move the seeds away from their potential predators. Native rats regard seed trays as something of a smorgasbord, so always ensure they are out of reach.

1. Seed enclosed in a hard shell:

Examples:

Aleurites moluccana	Candlenut
Elaeocarpus spp.	Larger Quandongs
Athertonia diversifolia	Atherton Nut

Remove any flesh covering the hard shell. The shell requires cracking to stimulate germination. With little control over direction or force, cracking the shell with a hammer will destroy a large percentage of the seeds. Instead, place the seed end to end (where the fruit was attached to the plant is one end) in a vice and turn it slowly until a distinct 'crack' is heard.



Remove the cracked shell from the vice and sow. Occasionally the shell may split into two. Simply retrieve the two pieces, replace the seed inside and sow.

Germination can be sporadic, commencing in 30 days and in the case of *Elaeocarpus* species, it may continue for 12 - 18 months. Sporadic germination over a few years has been achieved in several smaller *Elaeocarpus* species when spread on the surface of a garden bed in full sun under a nursery spray system. The bed is dug over from time to time as seedlings germinate and the seeds are not cracked.

This method does not apply to species with a leathery covering, such as the Kuranda Satinash *(Syzygium kuranda)* or to large fruited species such as Black Walnut *(Endiandra palmerstonii)*.

2. Seeds enclosed in a fleshy covering:

Examples:	
Acmena smithii	Lilly- Pilly
Syzygium spp.	Satinashes
Acronychia spp.	Lemon Aspens
Ficus spp.	Figs

The often brightly coloured flesh surrounding the seed provides food for the larval stage of many insects so it is a good idea to remove the flesh as soon as possible. Some fleshy fruited species *(Syzygium fibrosum, S. luehmannii)* have a high number of seedless fruits and by peeling them you can eliminate these fruits from the germination process.

The flesh can be removed by hand and this is made easier by soaking the fruits for 2-3 days. If there are grubs already present, dissolve some Carbaryl in the water before immersing the seeds. Always use rubber gloves when dealing with insecticides such as Carbaryl, and always read the label! Rinse the fruit before peeling and then sow the seeds as soon as possible.

In some species such as the Lemon Aspens *(Acronychia spp.)*, and the tiny seeded Figs *(Ficus spp.)* and Leichardt Pine *(Nauclea orientalis)*, removing all the flesh is tedious and not necessarily beneficial. In the case of *Acronychia spp.*, soak the seed until the flesh is soft and pulpy (7 - 10 days), then drain and place all the material on a tray to dry out. Sow all the material (dry flesh included). The fruits of *Ficus spp.* and *Nauclea orientalis* do not need to be soaked. Allow these fruits to naturally dry and shrivel, then crumble the material into small pieces and sow.

Acronychia spp. germination commences in three months and reaches a peak in five months. Germination of the remainder of the group is usually rapid (21 - 45 days) and reliable, though some of the smaller fruited *Syzygium* species such as Yarrabah Satinash *(S. angophoroides)* and Yellow Satinash *(S. canicortex)* germinate sporadically over a 60 - 120 day period.

Seeds in this group will often germinate while still slightly underripe. As a general rule, the thicker the flesh the more it needs removal and fresh seed always germinates best.

3. Seeds enclosed in a woody capsule or winged seeds:

Examples:	
Argyrodendron spp.	Tulip Oaks
Callistemon spp.	Bottlebrush
Darlingia, Cardwellia	Silky Oaks
Flindersia spp.	Maples, Silkwoods
Melaleuca spp.	Paperbarks
Xanthostemon spp.	Penda

The woody fruits of these genera should be collected slightly green as the small and/or inconspicuous seeds are shed very quickly. As soon as some ripening is evident pick the desired amount. Place the fruits on paper in a warm, dry area out of the wind. Fruits should begin to split in 1 - 4 days and the winged or small woody seeds will fall out of the capsule. In all the *Flindersia* species and other genera where seeds are arranged like the pages of a book, a 'divider' separates each individual seed. These 'dividers' should be discarded.

If fruits have not opened within seven days, the fruits were too green. Return to the tree and start again.

Germination is usually rapid and if it has not occurred within 14 - 30 days, it probably won't happen at all. A well-lit environment is essential. When sowing winged seeds such as *Flindersia* and *Darlingia* species, arrange the seeds (upright not flat) like pages in a book, burying about a third of the seed in soil.

4. Seed enclosed in a leathery capsule (often with a bright, fleshy covering or aril):

Examples:	
Guioa, Mischocarpus, Arytera, Diploglottis spp.	Tamarinds
Melicope spp.	Butterfly Trees
Myristica insipida	Nutmeg

The fruits of these genera frequently occur in colour combinations. A shiny black seed and a red or yellow aril set against the dull interior of the capsule.is a common characteristic of this group.

Remove the aril and capsule to reduce the chance of an insect attack and sow the seeds immediately. Germination periods vary between 30 and 60 days.

5. Seeds naked on cone scales (the conifers):

Examples:	
Araucaria cunninghamiana	Hoop Pine
Araucaria bidwillii	Bunya Pine
Agathis spp.	Kauri Pines

With the exception of Bunya Pine *(Araucaria bidwillii)* these seeds are flattened, arrow-shaped wings which lie between the scales of the cone. Collect these cones as they fall and allow them to split open in the same way as Group 3's woody capsules and winged seeds. If the cones have not split in ten days, return and collect more material as the cones were too green.

Hoop Pine *(Araucaria cunninghamiana)* and Queensland Kauri *(Agathis robusta)* show reliable germination. Black Kauri *(Agathis atropurpurea)* and Bull Kauri *(Agathis microstachya)* frequently display low viability rates. All *Agathis* seed should be sown very fresh.

Germination occurs in 30 - 45 days. *Araucaria bidwillii* should be propagated in the same way as Group 7's very large seeds. This species germinates sporadically over a 12-month period.

6. Pioneers:

Examples:	
Acacia spp.	Wattles
Omalanthus novo-guineensis	Bleeding Heart
Macaranga spp.	Macaranga
Alphitonia spp.	Sarsparilla

Seeds of this group are generally small and enclosed in a simple capsule. Because of their ability to cope with enforced dormancy, they are often recalcitrant, erratic germinators. Germination can be either very successful or a total failure, and only rarely falls between the two extremes. *Acacia* species and *Alphitonia* species usually germinate rapidly following boiling water treatment. Remove the pods or woody cov-

erings from the seeds and immerse them in boiling water. Drain the water off in an hour or two and sow the seeds.

For *Omalanthus novo-guineensis* and *Macaranga* spp simply remove the seeds from the capsules and sow them immediately.

Germination usually occurs in 14 - 40 days. If nothing has happened in three months throw the contents of the seed tray under a tree in the garden. This often stimulates the entire tray to germinate.

7. Very large seeds:

Examples:	
Araucaria bidwillii	Bunya Pine
Castanospermum australe	Black Bean
Endiandra palmerstonii	Black Walnut
Syzygium gustavioides	Water Gum

These species typically develop extensive root systems before a shoot appears above the ground, making potting from a seed tray difficult and stressful for the plant. To overcome this problem simply sow each seed onto the top of a pot. Pots should be tall rather than broad.

Black Bean *(Castanospermum australe)* should be sown with the 'split side' facing up and Bunya Pine *(Araucaria bidwillii)* should be sown with the sharp end pointing into the soil. Other large-seeded species appear to germinate in any position.

Germination periods can be sporadic and lengthy. Many large-fruited species seem to be able to remain dormant over winter and spring and germinate in early summer.

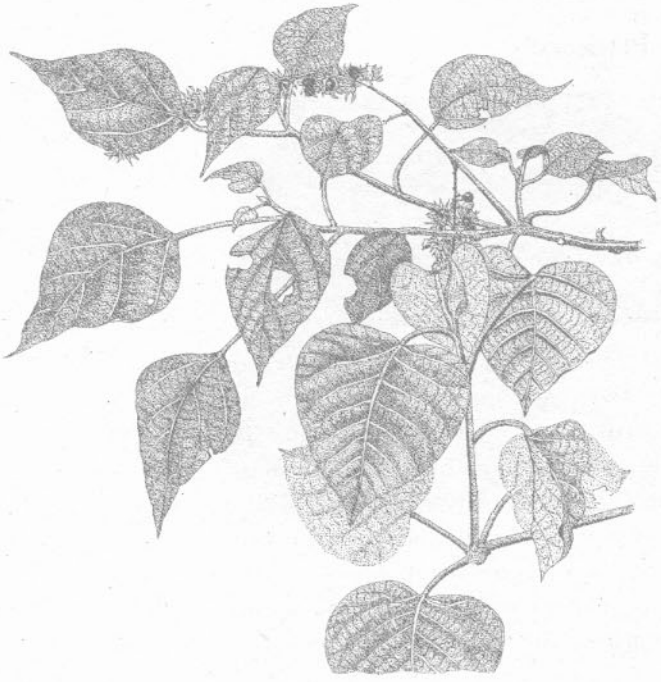
Sowing

Coarse river sand should form around 50% of the seed raising mix. Other material including local soil, vermiculite, peat, sawdust and organic material can be incorporated to provide an even textured mix. Do not add any fertiliser to the seed raising mix.

Avoid deep trays. They promote lengthy root systems which unduly stress seedlings at potting stage. Ideally, trays should be between 60 and 100mm. Fill the tray and ensure the mix is level. Water has a tendency to settle in depressions and causes seeds to rot.

Arrange or sprinkle the seeds evenly over the top of the mix and cover them with a light material such as 10mm volcanic scoria (known locally as Quincan gravel), vermiculite or sawdust. Very fine seeds such as Paperbark or Bottlebrush *(Melaleuca* species) should have only a light covering.

Water the seeds in immediately after sowing to expel any air pockets in the mix and to settle the seeds into the propagation medium. Always water seed trays with a misting or small droplet sprinkler. Trays should be placed in a well lit environment (though not in direct sunlight) with good aeration and raised off the ground.



6. Pioneers: Bleeding Heart (Omalanthus novo-guineensis)

Potting

The sowing mix can also be used as a medium for growing stock to planting size, however fertilizer will need to be added for this stage. This fertilizer would ideally be a slow release form which provides continuous nutrition, applied at the recommended rate. Organic fertilizers can also be used.

Most seedlings should be potted when they reach between 30 and 60 mm in height though some larger fruited species may reach 300 mm before leaves are produced and the stem begins to develop a woody exterior. If seedlings are allowed to become too large they can become difficult to separate and are unduly stressed at the potting stage.

Once potted, immediately water in the seedlings and transfer them to a shade-house or similar environment. Allow the plants about 3 weeks in this environment before moving them to a more permanent position in full sun where they can be suitably hardened off ready for planting at the appropriate time.

Where to from here?

There is a significant body of expertise in north Queensland to assist anyone interested in undertaking tree-planting activity. Government land management agencies, community tree planting groups and local land care/conservation groups are a good place to start. These organisations offer a variety of services depending on the kind of project being considered. Always seek out as many opinions as possible to ensure you receive consistent and correct advice.

Government agencies

Qld Department of Environment and Heritage
Lake Eacham Regional Nursery
McLeish Road, Lake Eacham 4883
(or contact your local QDEH office)

Queensland Department of Primary Industries
Queensland Forest Service
Main Street, Atherton 4883
(or contact your local QFS office)

Queensland Department of Primary Industries
Peters Street, Mareeba
(for advice on your nearest Land Care group)

Wet Tropics Tree Planting Scheme
Local Government offices in north Queensland's Wet Tropics area will be able to assist with information on the Wet Tropics Tree Planting Scheme, Land Care activities and any other tree planting or tree assistance schemes conducted by your local authority.

Community Tree Planting Groups

Trees for the Evelyn and Atherton Tablelands (TREAT) Inc.
PO Box 1119
Atherton 4883

Community for Coastal and Cassowary Conservation (C4) Inc.
PO Box 165
Mission Beach 4872

Daintree Cassowary Care Group
PO Box 871
Mossman 4873