

Seed Identification



The Seedy Side of Plants



Lower Hunter Region
Community Seedbank



AUSTRALIAN Government
envirofund





Lower Hunter Region Community Seedbank

The objectives of the Seedbank programme are

- To provide facilities for the collection, sorting and storage of local indigenous seed
- To provide the community with education and training on 'best practice' methods used in the collection, sorting and storage of local indigenous seed
- To encourage the community to use local indigenous seed and plants in their revegetation activities
- To promote the 'Florabank' guidelines to the community for the collection, sorting and storage of local indigenous seed
- To maintain an up to date database of all local seed collection records



Lambertia formosa



Lambertia formosa

The objectives of the Community Education and Training programme are

To provide workshops and training notes covering

- Fruit and Seed identification, dispersal and pre-germination treatment
- Seed collection methods and techniques
- Seed cleaning methods and techniques
- Seed storage methods and techniques

Workshops will be designed to encourage the community to use the facilities of the Seedbank for the seed collection, sorting and storage of local indigenous seed from their own local reserves and/or Council areas for their own revegetation activities



Why use local indigenous seed?



1. Flora and habitat conservation
2. Genetic conservation and integrity
3. Economic benefits
4. Local landscape character
5. Education





Why use local plants?

(Murray Ralph, 2003)

1. Flora and habitat conservation
By planting local native plants we directly contribute to the conservation of the flora of the local area. As many species of birds, mammals and other fauna are dependent on the local vegetation we can also contribute to habitat conservation and therefore survival of local fauna as well.
2. Genetic conservation and integrity
The use of seed collected from local native plants contributes to the maintenance of genetic variation and integrity within native species.
3. Economic benefits
As local native plants have adapted over long periods of time to suit local conditions, the use of plants grown from locally collected seed generally result in greater long-term survival rates.
4. Local landscape character
The character of our landscape is largely a product of the local indigenous vegetation.
5. Education
The use of local native plants provides opportunities for learning about the local environment



Doryanthes excelsa and *Telopea speciosissima*



Kimseed vacuum separator



Record keeping



Seed drying



Seed collection bags on drying rack



The collected Banksia requires a heat treatment to release the seed



Seed is stored in airtight containers for future use.



Seed is propagated in the igloo



Seedlings are grown up in the nursery



Seed Identification and Dispersal

Woody Capsules
Papery Capsules
Soft Woody Capsules
Legumes or Pods
Drupes or Fleshy Fruit
Berries
Follicles
Nuts
Grains
Achenes and Cypselas
Cones



Acmena smithii



INTRODUCTION

It is important to know what kind of seed you have so you may understand how to clean and treat the seed or fruit in the right way.

Seed and fruit are designed in specific ways to release the seed at the right time, in the best place, and in the best way for optimum dispersal for germination and regeneration.

WOODY CAPSULES

Genus includes:

Eucalyptus, Callistemon, Melaleuca, Leptospermum, Angophora

Defined by the dehiscent, hard woody capsule, which holds and protects the fine seed from fire and heat.

Seed Dispersal Method

The valves at the top of the woody capsule, opened by 24 degree heat or fire, release the fine seed to be dispersed by wind or water or simply bird movement on branch ends.

Eucalyptus robusta



Callistemon citrinus



Melaleuca thymifolia



Leptospermum polygalifolium





PAPERY CAPSULES

Genus includes:

Lomandra, Dodonea, Bursaria, Wahlenbergia,

Often thin or papery dehiscent capsule and quite brittle when mature, these capsules release small seed from inside once agitated. Both types have a larger seed, than the hard woody capsules, in common.



Dodonea triquetra

Seed Dispersal Method

Having a papery like wing or outside part of the seed enables it to be tickled by wind or passing animals to release the seed to the ground where it may be eaten whole by birds or germinate straight away.



Lomandra longifolia

SOFT WOODY CAPSULES

Genus includes:

Sloanea, Glochidian, Tristaniopsis, Alphitonia, Cupaniopsis, Dysoxylum, Baloghia, Mallotus

This type of seed is defined by dehiscent capsules, which are softer than hard woody capsules. Also, these are often rainforest species, which can be destroyed by hot fire.



Glochidion ferdinandi

Seed Dispersal Method

Soft woody capsules when fully ripe, open in sections, or carpels. Those that have a single seed in each section are known as schizocarps. The seed is released to the ground where it can be washed down a creek or sit in seasonal water. These seeds may also be eaten whole by birds.



LEGUMES OR PODS

Genus includes:

Acacia, Indigophera, Pultanea, Dillwynia, Kennedia, Jacksonia

Defined by those seed covered with a pod which is dehiscent, these are often part of the Fabacea family.



Acacia ulicifolia

Seed Dispersal Method

Often seeds are flung or catapulted by the pod opening with a spring action. This is no doubt designed to cast the seed away some metres to enable continuation of colonization. Others open slowly, possibly to enable birds to get at them off the ground. Seeds on the ground are often carried by ants to their nest, where the water resistant layer is broken by movement, sand and eventually water. This will often cause germination from the nest. Also, ground dwelling birds and animals eat the seed and disperse them in droppings if eaten whole.



Kennedia rubicunda

DRUPES AND FLESHY FRUIT

Genus includes: Persoonia, Acmena, Syzigium, Leucopogon, Eleocarpus, Melia

Drupes are generally defined by a single indehiscent seed testa which has a fleshy outer layer. However, some fleshy drupes have 3 5 seeds inside the flesh, for example *Planchonella australis*



Acmena smithii

Seed Dispersal Method

Most of this kind of seed or fruit is designed to go through the stomach of a bird, bat, lizard or other ground animal. The flesh on the outside of the seed is



the animal's reward for helping the seed to germinate. Acid in the stomach helps break the seed testa. In the case of *Planchonella australis* the fruit is too big to be eaten whole and so is designed to be buried for storage by ground animals where the seed will readily germinate with constant moisture.

BERRIES

Genus includes: Dianella, Rubus, Solanum, Tetragonia, Ficus, Billardiera

Berries are defined by the fleshy indehiscent fruit which contains many seed.



Seed Dispersal Method

Some berries are designed to be eaten by birds, bats and ground animals such as Blue Tongue Lizard, who likes a good feast on *Rubus spp* and *Dianella spp*, however many will germinate readily falling on the moist ground. Some berries have mechanisms designed to not allow ground animals to destroy the inner seed by having a mouth blistering action if eating is attempted. For example *Solanum aviculare* (which germinates at 24 degrees). Such fruit is designed not to be eaten at all except by specific animals, as seed will not germinate if crushed.

Billardiera scandens

FOLLICLES

Genus includes: Banksia, Hakea, Grevillea, Brachychiton

Defined as dehiscent capsules, similar to woody capsules, however the seed or follicle is released from a major split down the length or side of the seed casing.



Seed Dispersal Method

Hakea bakeriana

This kind of seed is discharged from its casing by heat or fire. The outside casing is quite tough to protect the seed from burning before it can be released. After the casing opens the papery wings of the seed enable it to be dispersed by wind. The exception to this rule is *Brachychiton spp*. which is nut like, and can readily germinate on moist ground.



NUTS

Genus includes:

Juncus, Carex, Gahnia, Isolepis, Baumea, Cyperus, Ceratopetalum

Nuts are dry and indehiscent with a thin outer shell containing a single seed. Schizocarps fall into this category except they have 4 nut seeds to each thin outer shell. Examples of these are *Westringia spp* and *Prostanthera spp*.

Seed Dispersal Method

Nuts are mostly eaten by birds, but can also be dispersed by wind and water and fire.



Gahnia clarkeii



Juncus sp

GRAINS

Genus includes: **Themeda, Danthonia, Stipa, Dichlachne, Spinifex, Poa**

Each seed head contains numerous individual fruits fused and covered in a fine papery casing.

Seed Dispersal Method

Some grains are covered with a barbed casing which is designed to latch on to the fur of passing animals or the clothing of humans to enable it to disperse further a field.

A quick hot fire can release the seed to the ground to be germinated at the next rain. Small grains are often eaten by birds, which have good techniques for dehusking prior to swallowing.

Themeda spp have a dormancy period, which is an inbuilt technique designed to take the seed through the heat of summer. The dormancy will only break with rain after fire or a period of cold.



Themeda australis



ACHENES AND CYPSELAS

Genus includes: *Helichrysum*, *Clematis*, *Brachycombe*, *Cassinia*

Defined as single seeded fruits, which often have a papery attachment called a pappus, these occur in tight clusters in the seed head, or from one single point such as *Clematis spp.*



Brachycome multifida

Seed Dispersal Method

As the seed ripens the seed head loosens and is easily released by wind as individual seeds look like parachutes. Seed of this type are also eaten by small birds.

CONES

Genus includes: *Allocasuarina*, *Callitris*, *Petrophile*, *Isopogon*, *Macrozamia*

The Genus in this category produce seed in cones which are released when the cone becomes hard and dry and turns brown. *Petrophile sp.* and *Isopogon spp* release a hairy nut like fruit, *Macrozamia* ,a nut like seed, where as the others appear to be follicle like.

Seed Dispersal Method

Seed follicle types inside cones are generally designed for wind dispersal, others to be eaten by birds, specifically Cockatoos, all are released by a hot quick fire or hot sunny day.



Allocasuarina distyla



Isopogon anemonifolius



Macrozamia communis



Seed Germination and Treatment Table— for a few species

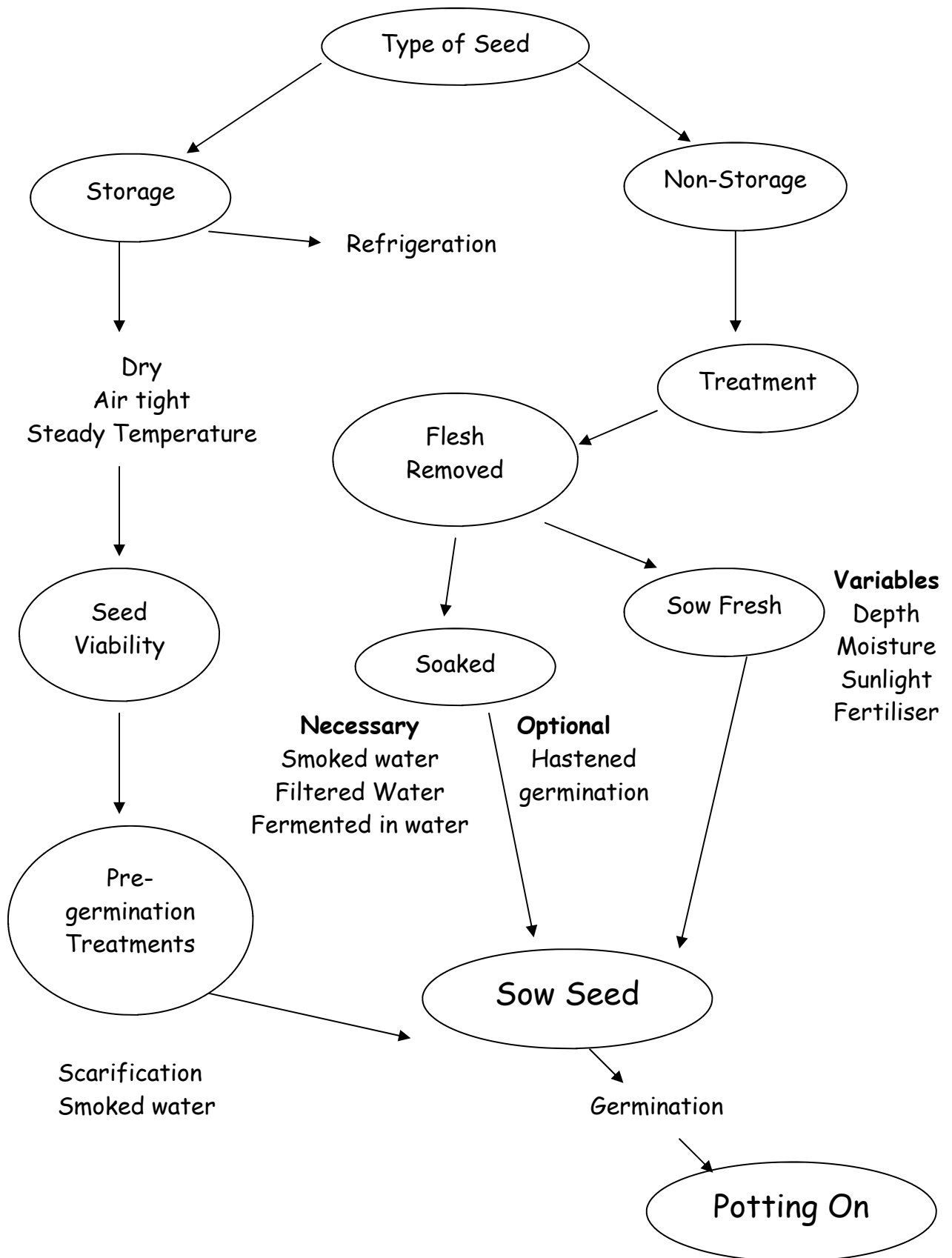
Botanicalname	Commonname	Family	Typeof fruit	Ripe	Germination Treatment	Dispersal method	Storage	Storage viability	Cuttings	Germinationlength	TINexperience
Acaciafimbriata	FringedWattle	Mimosaceae	Pod	Nov-mid Dec	Boilingwater/ Scarification.~25 viableseeds/gm		Dry				BoilingH ₂ O, successful.
Allocasuarina verticillata	DroopingShe -oak	Casuarinaceae	Cone		Smoketmt.Best ifinoculatedwith <i>Frankia</i> spp whensown. Viability~120 - 270seeds/gm.		Treatwith fungicide& insecticide. Dry,room temp.	Atleast5 yrs.		2-6wks.25 - 30°Cbest.	
Aotusericoides	Aotus	Fabaceae	Pod	EndOct - Nov	Boilingorhot watertmt(70 - 100°C),ordry heat(80 -100°C). Nickingmay help.	Ants		Long.		3-6wks. Avoidover - wateringas pronetorot.	BoilingH ₂ O successful.
Austrostipa pubescens	TallSpeargrass	Poaceae	Grain		After-ripening periodmay be2 -24months. Removalofhusk maypartially overcome dormancy, smoketmtmay helpolderseed.		2-24 months.			3-10wks withnon - dormant seed.	
Banksiaserrata	OldManBanksia	Proteaceae	Follicles	Allyear	Viability~18 seeds/gm.			Atleast3yr		Possibly slow.	3yroidseed successful
Billardierascandens	Dumplings,Apple -berry	Pittosporaceae	Berry	Jun-Apr	Removeseed frompod.Clean seedindiluted detergent.				Easilygrown.	8-10wks.	SoakedH ₂ O 8days;fermented 21days.
Bursariaspinosa	Blackthorn	Pittosporaceae	Papery capsule	Apr-Aug, Nov	Stratification,2 ⁰ -4 ⁰ for3 -4wk	wind	dry	8years	yes	SowinJul - Aug.4 -6wk, maybeerratic.Need 10 ⁰ day/5 ⁰ night,prone todamping off.	2yroidseed successful

Carex gaudichaudiana	TuftedSedge	Cyperaceae	Nut	EndDec	Bogmethod. Doesn'tsetseed regularly.					Easily propagated bydivision		
Dillwyniaretorata	ParrotPea,Eggsand Bacon	Fabaceae	Pod	MidOct - earlyDec	Boilingorhot watertmt(70 - 100°C),ordry heat(80 -100°C). Nickingmay help.	fire	Dry,5-10 years			Canbe grown		BoilingH ₂ O, very successful
Eupomatialaurina	BolwarraNativeGuava	Eupomatiaceae	Achene	Apr-Jun May,Jul, Aug	Fresh-remove pulp	Hostspe- cificWeevil	Dryand refrigerate	1-2days	Slow	19-35days		Sownfresh, removed flesh: successful
Isolepispodosa	KnobbyClubRush	Cyperaceae		Oct-Dec, Feb-Apr, Jun,Aug	Bogmethod. Smoketmtmay help.Sow shallow-light maybeneeded.			Atleast2 yr.TIN success 2.5yr		4-5wks,sow latespring/ early summer		Successful withsmoked H ₂ O(?) (>1000plants/batch)
Leptomeriaacida	NativeCurrant,Acid Drops	Santalaceae		Sep								
Lissanthesapida	NativeCranberry	Epacridaceae		LateOct	Propagationfrom seedisdifficult. removeflesh, mayneed1yr naturalweathering, thensmoke, possalsoheat.			Possibly several years	Usually grownfrom cuttings, whichare slowtostrike.			
Prostantheraincana	VelvetMint -bush	Lamiaceae			Resultsmaybe erratic. Seed viabilitymaybe lowinheavy seedcropyears. Smoketmtmay help.			Useseed thatisless than6mths old.	Cangrow fromcuttings withaheel takenfrom youngplants only.	3-10wks. Sowinlate win/early spr.Cover lightly.		
Xanthorrhoea macronema		Xanthorrhoeaceae		Dec- Feb, May-Jun	Mostsppgood resultsfrom seed.Coldtmt mayhelpsome spporsmoke tmt.			Fresh recommended butsome sppmaybe okfor years.		Somespp mayneed4 - 52wks.Slow growing, maytake2 -3 yrtoreach plantable size.		





TREATMENT & METHODS OF SOWING & PROPAGATING NATIVE PLANTS





NOTES

Schizocarp: A dry fruit which when mature divides into several one-seeded carpels.
Each carpel is known as a mericarp or a coccus

Dehiscent: opening at maturity to release the contents of the fruit.

Indehiscent: not opening at maturity to release the seed



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NOTES



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