

Seed Storage



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 for the community



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



INTRODUCTION

Workshop 3: Seed Cleaning and Treatment

Workshop 4: Seed Storage.

Introduction

What happens to the ripe seed after it is collected?

Cleaning, treatment and storage of native seed are very important practices if the seed is going to be at its most viable. Any knowledge we have and can apply to maintaining viable seed, ultimately contributes to the health of our bushland areas, keeping the evolutionary processes continuing.

Cleaning the seed well, treating seed with special considerations and practicing the best methods of storage, will effect the viability of the seed and can be the difference between a high germination rate and none at all.

An understanding of why fruit and seed are designed the way they are helps us know what to do with fresh seed, so an understanding of the natural dispersal identification of the type of seed you have is invaluable (workshop 1).

Flora, fauna and fire observations are invaluable. Understanding the connection and roles of animals, weather, soils and seed types is also an important key to our treatment of seed.

Knowledge in the area of seed treatments for germination is still being accumulated and correlated. Some fruit and seed are difficult to germinate for one reason or another. Viability time frames and dormancies, are just starting to really be known and understood.

This workshop is designed to support our natural seed resource by understanding and preserving what we hold in our hands, in the best way possible.



Seed Storage

Storage Methods
Record keeping
Monitoring
Viability
References
Acknowledgements

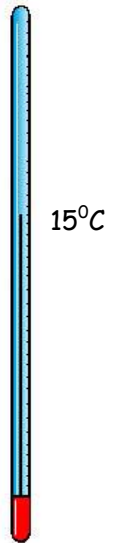




STORAGE FOR OPTIMUM VIABILITY

Storage of the seed is undertaken when it is clean and dry, and when it is impossible to sow at the time of collection. It aims to keep the seed at its best condition for viability.

- It is important to store dry seed free from pests and disease and the chosen container or bag must be air-tight.
- Only fruit that is fully matured will be stored.
- Dry storage temperature should be constant, and should reach no more than 15 degrees. Temperatures can vary for different seed.
- Areas of darkness and low humidity should be sought to store the air tight containers. Air-conditioning units can be used.
- Storage time frames can vary from one seed type to another.
- Fruit to be stored in the fridge will be stored constantly at 2° Celsius but cannot be stored for longer than a year and less depending on the species.
- The Flora Bank Guidelines include a code of practice for improving on seed storage, germination and viability tests and keeping records.



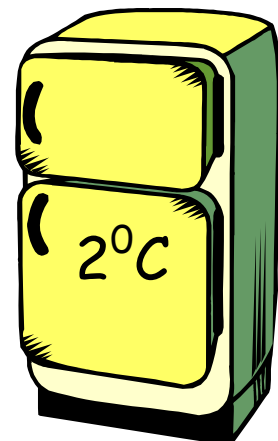
Storage Methods Include:

1. Cool, air conditioned, dark space at constant temperature of approximately 15 degrees Celsius
2. Refrigeration to hold seed at 2 degrees Celsius
3. Air-tight Jar or sealed plastic bags-

Must be a very good seal and some suggest all the same size and shape for better fit in storage area.

4. CO₂ Sealed Bag-

A cellophane or plastic bag is partly sealed and filled with CO₂ gas and then the bag is completely sealed with a bag melting sealing device. The advantage of this method is that the CO₂ kills bugs on contact.












RECORD KEEPING

Record keeping is very important for monitoring. Germination schedules can be planned to adhere to expiry dates of stored batches. Seed should be germinated long before the time expires for maximum viability and to avoid seed wastage.

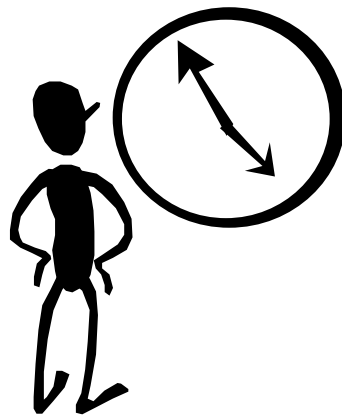
It is very important to keep the following records:

-  name of species
-  collection date
-  collection location
-  collectors name
-  date of storage commencement
-  expiry date
-  weight (optional)

Please refer to the seed storage record sheet example and make sure you fill one in when you finish cleaning your seed.

MONITORING

Monitoring of the seed should be undertaken at weekly or annual intervals. Refrigerated seed should be checked for hardness, as if kept too long they will rot and become squashy. Dry seed should be checked for mould, surviving pests, adequate seal, and freshness.





VIABILITY

The viability and germination rate of stored seeds can be tested by germinating 1% (or up to 10 seeds if you have a very small amount). Viability can also be tested by observation. Looking for holes, squeezing hard seeds to check for softening and placing seed in water to see if any float, are all good ways to check viability.

The following information is general to the types of seed and fruit and any exceptions to the storage timeframe, will be covered in the Full Seed Data Reference Sheet provided.

WOODY CAPSULES

Storage Viability

5 - 10 Years if cleaning and storage guidelines are adhered to.

Storage

Store in an air- tight jar or cellophane bag or CO2 filled and sealed bag.



Eucalyptus robusta

PAPERY CAPSULES

Storage Viability

Can be stored up to 5 years in optimum storage conditions.

Storage

Seed must be dry before storage in an airtight jar or CO2 filled bag in a room of constant temperature below 10 degrees.



Lomandra longifolia Common name: Scribbled Wattle

SOFT WOODY CAPSULES

Storage Viability

May keep for some years well dried and treated for example *Alphitonia excelsa* will keep for up to 20 years.

Storage

Seed must be completely dried and free from bugs. *Cupaniopsis anarcardiodes* will rot in the fridge.



Alphitonia excelsa Common name: Red Ash

LEGUMES OR PODS

Storage Viability

This kind of seed can last for between 5 and 10 years.

Storage

Must be dry before putting into container, optimum conditions apply.



Dalmanella retorta Common name: Eggs & Bacon



DRUPES AND FLESHY FRUIT

Storage Viability

Viability is not guaranteed if fruit is stored dry for any period of time, there are some exceptions, but most fleshy fruit can only be stored for a couple of weeks in the fridge. Species which need to ferment can be held for up to a year

for example *Planchonella australis*

Most will need to be cleaned and sown straight away for best viability.



Elaeocarpus reticulatus

Storage

Some seed will allow dry storage after the flesh has been removed, but with short window of viability. Most must be refrigerated for no more than one week.

BERRIES

Storage Viability

Generally this kind of seed needs to be germinated fresh.

Fresh cleaned and dried seed can keep up to one year, for example *Dianella spp.*

Storage

Storage by refrigeration for a week yields a more reliable germination.



FOLLICLES

Storage Viability

Correctly dried and stored seed will last up to 10 years

Storage

Must be dried and free from bugs and placed in an air-tight container or CO2 bag.





NUTS

Storage Viability

Will possibly last for 10 years or more.

Storage

Store completely dry and free from pests.



Gahnia clarkei

GRAINS

Storage Viability

Possible to be still viable after 10 years.

Storage

Store completely dry at a constant temperature and free from pests.



Themeda australis

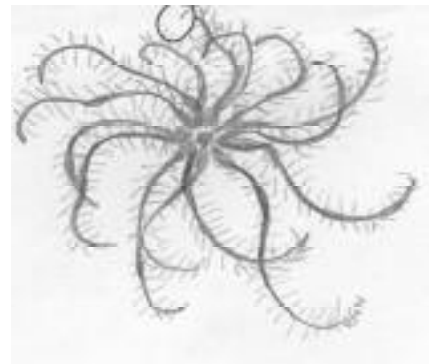
ACHENES AND CYPSELAS

Storage Viability

Dried properly will last for over 5 years

Storage

Stored dry and released from flower head.



Clematis

CONES

Storage Viability

May store for up to 5 years.

Storage

Dry storage at a constant temperature and free from pests.



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.
Allocauarina 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.	3yrolseed successful
Billardieras scandens	Dumplings,Apple -berry	Pittosporaceae	Berry	Jun-Apr	Removeseeds 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, maybeeratic.Need 10 ⁰ day/5 ⁰ night,prone todamping off.	2yrolseed successful

Carex gaudichaudiana	TuftedSedge	Cyperaceae	Nut	EndDec	Bogmethod. Doesn'tsetseed regularly.					Easily propagated bydivision		
Dillwyniareorta	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	
Isolepisnodosa	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.		





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Acacia echinula



Blandfordia grandiflora



Styphelia laeta



Billardiera scandens



Pultenaea palacea var palacea



NOTES



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