

Seed Collection



The Seedy Side of Plants



Lower Hunter Region
Community Seedbank



AUSTRALIAN Government
envirofund



Natural Heritage Trust
Building Communities, Restoring Australia
An Australian Government Initiative





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



Preparing for Seed Collection

Florabank Guidelines
Occupational Health and Safety
Tools & Safety equipment Checklist
Environmental considerations
Legal Considerations
Planning ahead
Collecting Seed
Collecting Techniques
References





Florabank Guidelines for seed collection, sorting and storage

The aim of the Florabank guidelines is to promote the adoption of national best practice in seed collection, sorting and storage by community-based seed collectors and suppliers.

The Florabank guidelines include:

- A 'Model Code of Practice'
- Native seed storage for revegetation

- Basic methods for drying, extraction, and cleaning of native plant seed
- Improving on basic native seed storage
- Keeping records on native seed
- Seed collection from woody plants for local revegetation
- Native seed collection methods
- Seed production areas for woody native seed
- Basic germination and viability tests for native plant seed
- Using native grasses in revegetation
- Seed collection ranges for revegetation

Copies of the Florabank guidelines are available at www.florabank.org.au

We have included a copy of the Florabank *'Model Code of Practice'* for community based collectors and suppliers of native plant seed in our information and training kit.





Occupational Health and Safety

Seed collecting comes with its own set of occupational health and safety concerns. The following common hazards are involved in seed collection, and some precautions are necessary to make the experience enjoyable and safe:

Sun exposure- appropriate clothing & sun protection is needed and this includes long-sleeved shirt, suitable sturdy shoes, long pants, wide brim hat & sunscreen. Sunglasses are also recommended.



Sunstroke & dehydration- In hot weather you need to be aware of losing too much water from your body. Make sure you drink water & keep in the shade as much as possible.



Poisonous, allergenic and hazardous plants - You may need to wear protective gloves for hazardous plants. For eg, *Hakea sp.*, *brachychiton sp.*, *Isopogon sp.*, Branches can also scratch you and in thick bush eye protection is necessary.



Wildlife - Keep an eye out for snakes, ticks, spiders, ants, mosquitoes, sand flies, leaches and paper wasps. Appropriate clothing and PPE, insect repellents and awareness are all helpful for your protection.



Safe use of equipment and hand tools - If using secateurs or other sharp tools you need to be mindful not to cut your hands and fingers. The operator of extension pole pruner needs to wear a safety hat and glasses. At times where the seeds are very high it is necessary to have two people with PPE using the well extended lopper, one to hold and one to cut. Otherwise it is advisable to stand well clear as branches will be falling.



Specific site, weather and seasonal conditions -Each site and seed collection trip needs to be individually assessed for topography and safety risks. Some common site conditions include

- steep slopes, cliffs, wet slippery rocks or paths
- evidence of mine subsidence. Stay clear of large holes or cracks in the ground.
- potholes, logs, twigs. Watch out for large branches, which can fall particularly in previously wet and windy weather.
- If you are collecting on a roadside be aware of traffic you need to be aware of seasonal conditions such as bushfire threat.



Always be open to modifying your seed collection activities if the risks are too great.



Environmental considerations

Ecologically sustainable collection

You need to consider the amount of seed you are collecting from any one area, species or individual plant. The aim in seed collecting from local plants is to assist the environment not to exploit it. Seed can be collected in an ecologically sustainable manner if you are mindful that the local vegetation is a life-sustaining resource not only for humans but for all other life as well. This includes taking too much for your resources to deal with, so avoiding waste

Minimal damage/ disturbance

Seed collection is not benign and even the best collectors may cause some damage to plants and also vegetation under-foot. Care should be taken at all times to minimise damage to the environment and minimize disturbance to nesting sites .

Florabank guidelines

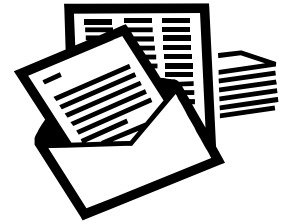
TIN follows the guidelines provide by Florabank. These guidelines include a Model Code of Practice for community based collectors and suppliers of native seed. Florabank guidelines recommend that you collect no more than 20% of seed crop/ fruit on any individual plant (Florabank Guideline 5, p. 8).





Legal Considerations

To collect seed with a clear conscience you will need to obtain permission from the landowner and maybe acquire appropriate permits or licences



Private land

Consent from the owner of the land is always required. Written consent from the landowner is best but verbal consent is more common. In some cases private land may also be covered by regulations such as the Threatened Species Act or Voluntary Conservation Agreements



Local council land/ State & Commonwealth Agencies land

Written permission is required from the organisation that has care and control of the land. TIN has permission from LMCC to collect on land under their control.



Public land (NPWS land/ State forests/ Crown land)

Special permits are required from NPWS and State Forests for seed collection. Permits are usually not granted unless for specific projects in these areas. TIN has collected seed in Glenrock State Conservation Area for rehabilitation of a disturbed quarry site, for example, but otherwise has no permission to collect from this area. For Crown land written permission or a permit is usually required.



Rare, endangered and threatened species

There is a legal requirement to obtain licenses to collect seed from rare, endangered or threatened plants.



Tetraloche juncea



Planning ahead

Planning your seed collection trip is useful. A checklist of safety collection equipment is essential.

Prior knowledge of the topography and the type of vegetation in the area you intend to collect from will save you a lot of time also. You can strategically plan from which side of the area you should enter to maximise your time and choose the safest or easiest access route. At TIN we plan seed collection trips so we collect from as many different vegetation types as possible but sometimes we target specific areas and species because of time constraints.



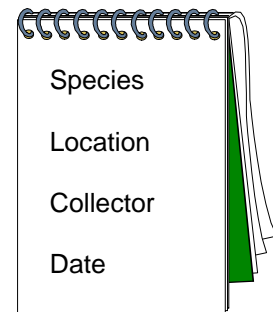
Target species

You should have a clear idea of the species from which you wish to collect and also which of those are priorities. This enables you to plan how long you need to be out for so if there is a rain period coming you can be out and back before it happens Also you are not wasting time walking further than the seed source and you can let someone know approximately when you will be back.



Using your records





Use your records to help you ascertain when seed in specific areas could be ready. Bush walking outings can help you gather information on what's flowering and starting to seed.



It is important to keep records of seed collection as they are a valuable resource for planning and integrity and conservation issues. This can be especially important where they involve complete coverage of a local area or region (See Florabank, Guideline 4, p.2).

TIN has a comprehensive data base of its seed collection activities. We use these records regularly to plan our seed collection tips.

Seed collection records should include at the bare minimum

-  Species collected
-  Location of collection
-  Collectors name
-  Date collected



Tools & Safety equipment Checklist

Essential

- First Aid Kit
- Mobile Phone
- Water and cups
- Paper & Plastic Bags
- Pens & tags for labelling
- Secateurs
- Extension Pole pruner
- Protective Gloves
- Safety glasses/sun glasses
- Insect repellent
- Sunscreen.
- Field collection data sheets

Optional

- Camera
- Site survey sheet
- Rope saw
- Plant Identification Books
- Binoculars
- Hand lens
- Maps
- GPS equipment (Global Positioning System) instrument, maps and compass
- Throwing rope with weight, rope saw, bow saw etc.
- Battery operated vacuum cleaner
- Rifle
- Nylon stocking
- Hard hat
- Plastic drop sheet
- Esky (for cuttings)



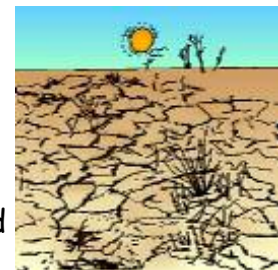
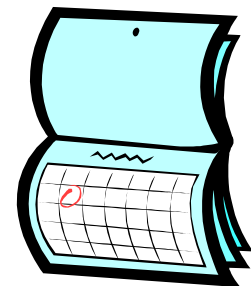
The Seed collection

Some information you should know about the plants before you collect seed

- k Seed identification
- k Understanding the stages of seed ripeness
- k Botanical descriptions
- k Distribution and occurrence in the local area
- k Safety precautions (allergenic or poisonous)
- k Flowering, fruiting and seeding times
- k Number of fruits per plant
- k Number of seeds per fruit
- k Shedding timeframes and conditions (hours, weeks, months or years)

Timing of seed collection

The timing of much of our seed collection can be predicted by seasonal flowering and fruiting patterns. However weather conditions can change these patterns considerably. Changes could include unseasonable or torrential rain, exceptionally unseasonably hot weather, drought. Other conditions can include bushfire and degradation of forest areas. An important element of seed collection trips therefore involves observation of the condition of the site and stage of maturity of fruit and seed for future collecting.



The number of flowers and fruits produced may vary from year to year and from stand to stand of trees, as this is both genetically and environmentally controlled. Some species show genetically determined cycles in the timing and number of seeds they produce and have big seed years when bumper crops are available for collection. However local environmental conditions such as drought or insect attack can modify this cycle (Florabank Guideline 6, p.6).



Seed retention and differential ripening

The length of time that seed remains on the plant after it has matured is an



important factor in the timing of seed collection. Depending on the species this can vary from immediate release once ripe to several years retention on the plant after maturity. Species such as *Callistemon* and *Melaleuca* may have three sets of seed on one branch. The closest to the tip will be the most recent and not as ready as the closest to the trunk, from two years previous.



With species that release their seed soon after maturity, timing of collection is critical because if the opportunity to collect is missed it is at least another year away. The placement of nylon stockings or mosquito netting over the seed pods or capsules to catch the seed is recommended (See Ralph, p.32). Some species progressively release their seed over a period of months so that several trips may need to be planned. E.g *Acacias*, *Pultaneas*, *Themeda*

Collect mature seed

It is essential that fully mature (ripe) seed is collected. This requires the collector to determine when the seed is mature.



Species, such as *Callistemon* and *Melaleuca* can be collected at any time of the year because they can retain seed for some years. The older material should be collected in order to ensure seed viability.



Crop maturity varies over the natural distribution of a species due to factors such as latitude, altitude, distance from the coast, and weather conditions during flowering and seed set (Florabank, Guideline 6, p. 6).

Determining maturity should be based on observation and experience. Signs of maturity include:

- * Colour change
- * Seed and fruit hardness
- * Dryness of fruit
- * Ease of removal
- * Fruits opening



Blandfordia grandiflora



* Valves formed

Aim for the best genetic quality

Some basic guidelines for achieving genetic quality are:

- ★ Look for local plants that are in healthy and viable natural populations,
- ★ Ensure the target species is uniformly distributed
- ★ Make sure of plant identification. If there are doubts about identity it is essential to keep seed separate until it can be accurately identified
- ★ Collect seed from at least 10-20 widely spaced, healthy parent plants across the population ,
- ★ Avoid collection from closely spaced, neighbouring plants as they are likely to be closely related
- ★ Avoid collection from isolated plants (Florabank, Guideline 5, p.7)





Collecting Techniques

Tall vegetation

Always be on the look out for opportunistic collections from tall vegetation e.g. tree felling for housing developments, forestry, mining or power line clearance. Of course, Make sure the seed is fully formed and permission and safety co-ordination is arranged with tree felling operators and landowners.

Shrubs and ground flora

It is safer and easier to collect seed which is within hand's reach. However collection can still be tedious or difficult with prickly species. Care should be taken and heavy gloves need to be worn using secateurs.

Ropes and flexible cutting saws

Ropes with weights (such as a small sand bag) attached can be thrown or catapulted over branches to 12 metres high. Once the branch is 'lassoed' in this way, the collector can either pull the branch down lower into the reach of pole pruners or attach a flexible saw blade to the line and cut through the end of the branch (see Florabank, Guideline 6, p.9; Ralph, pp.35-36)

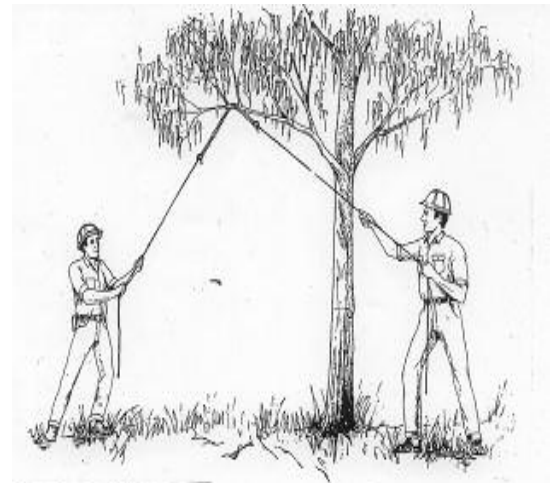


Fig. 1 - Using a flexible saw - Ralph, p.36)

Long-handled/ extension pruners

Secateurs or pruners with telescopic extension are useful for the lower branches of trees (4-8 metres). Some experience and stamina is needed to use these pruners.

Ladders/ hoisting equipment

To increase the height of extension pruners you can use three legged fruit pickers ladder or platforms fixed to roof racks above a vehicle.



Fig. 2 - Using long handled pruners - Ralph, p.38)



Hoists or specialised climbing equipment can be used to lift the collector into trees in a harness. Climbing trees or using hoists should not be attempted without proper safety equipment and training



Cherry pickers or hydraulic towers may be used but are expensive to hire and only useful where access is possible. (See Florabank Guideline 6, pp.9-10; Ralph, p.37)

Rifles

Rifles have been used to collect small amounts of seed. The technique is safe compared to climbing trees, but requires great care and specialised training as well as special licences and permits. The use of rifles is limited to sparsely populated areas and can be expensive (Florabank Guideline, p. 10)

Hand-picking

Hand picking is best with species where the fruits release easily from the branches such as with *Acacia spp.*, *Dodonaea spp.* or *Pultenaea spp.* Fruits are either picked individually or by running hands along the fruiting stems. Using bags with shoulder straps and a wide, rigid and open mouth is more efficient as both hands can be used.



Secateurs can be used where capsules are harder to remove or where fruits are densely clustered on a stem or fruiting stalk. Hand removal of tough clusters may be necessary where removal of the whole branch or stem will jeopardise the plant or unripe seed on the same branch.

Natural seed fall and seed traps

Large seed or fruits that fall to the ground when mature can be collected by laying tarpaulins or plastic sheeting on the ground or on purpose built frames underneath. Seed is then easily funnelled into a container.

Another type of seed trap can be made of nylon stocking and placed over seed pods or capsules to catch the seed as it is released. (See Florabank Guideline 6, p.8; Ralph, pp.39-41)



Native grasses techniques

Many native grasses mature in late spring and summer and seed is shed soon after maturity. High temperatures around this time can hasten seed development and seed shed therefore seed collection timing is critical.

The best way to collect ripe native grasses and sedges is by running a cupped hand along the seed heads in an upward motion or by cutting off the whole seed head with secateurs.



Themeda australis

Mechanical harvesting

The most widely used mechanical harvesters are the brush cutter and the portable vacuum. Brush cutters are used to collect native grasses, some brush cutters can have catchers attached. The slashed heads are raked, soon after cutting, and collected like hay. (Florabank Guideline 6, p. 8; Ralph, pp42-43)

Mechanical harvesting of native grasses has developed rapidly in recent years. Larger rotating brush harvesters (with or without vacuum to deliver seed to a hopper box) may be mounted in front of a tractor or towed by a four wheel drive vehicle. (Florabank Guideline 6, p.9; Ralph, p42-43)

Using a push mower with a catch is quite adequate and more available to most people.



The petrol driven garden blower/ vacuum can be used to collect seed. Some models duct incoming material through a macerating fan blade before depositing into a collection bag (although for many species it is best not to damage seed material). A portable vacuum is especially useful for collecting from small, low plants or those with profuse and fine seed, which may be easily vacuumed either from the plant or from the ground immediately below the plant.



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GLOSSARY

Aril: A fleshy appendage covering all or part of the testa of a seed, formed from the funicle.

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

Testa: The seed coat.



NOTES



ACKNOWLEDGEMENTS

Lachlan Anderson: Seed collection information

Barb Nanshe: Seed Identification, and dispersal and collection information

Peter Saunderson: Photographs

Suzanne Pritchard: Desktop Publishing

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