

Binginwarri LCG Seed Collection and Plant Propagation Day, November 11th 2012
Seed Collection Fundamentals
Compiled by Jenny Wolswinkel

Planning Seed Collection

1. Why collect seed? What are you aiming to achieve.
2. What species do you wish to collect, and how much seed will you need?
3. How easy or difficult will it be to collect and propagate seed from your chosen species?
4. How much time do you have available for collecting?
5. Given your aims, what will be the most effective use of your time?

1. Some theory

Collecting by provenance

If collecting seed for a specific revegetation project, you should firstly choose species that naturally grow there, and secondly collect seed from plants that are adapted to the soil, altitude, position and aspect of the site. This means looking closely at these characteristics of your revegetation site, and finding plant populations that are growing in similar conditions. You might find suitable populations on your property, or your neighbour's property, or you may need to go further afield.

Genetic considerations

A population of a single plant species, whether natural or planted, needs to be able to adapt to variation in its growing conditions, such as climate. The greater the genetic diversity within your planted area, the more likely it is to include individual plants able to cope with droughts, disease, insect predation and other challenges. Therefore you should aim to collect from as large a gene pool as practical.

Collect well-pollinated seed to avoid inbreeding

1. Collect from stands or groups of plants rather than isolated individuals
2. Target collection in years of above-average seed crops

Maximise your gene pool.

1. Collect from plants growing more than 3 plant-heights (or pollination distance) from each other within a stand
2. Collect seed from as many of these "unrelated mother plants" as possible - preferably 20 or more.
3. Take approximately equal amounts of seed from each plant, regardless of how much is available.

2. Further Planning

Permission and Permits

Private Property

In Victoria, with the exception of whole tree ferns and grass trees and protected habitat, you can collect from your own property without a permit.

To collect on someone else's property, naturally you should ask for permission first, and preferably in writing (to cover yourself).

Public Land

For any collection on public land, which includes State Forests, roadside reserves and Parks, you will need some form of permit. Go to the Department of Sustainability and Environment (DSE) in Yarram to apply for a permit to "Take Protected Flora under the Flora and Fauna Guarantee Act". For non-commercial collection, this is fairly straightforward. You may or may not need to pay royalties for any material collected from public land (currently just over \$2 per kg of material collected) - ask about this when you get your FFG permit.

Parks Victoria will need to be approached for collection from any Reserves or Parks - permission to collect on Parks-managed land is not easy to get, so don't bother planning to collect from Parks and Reserves unless

you have a special reason and there is really no alternative.

3. Preparing for Collection

Safety

There are many different types of safety risks inherent in seed collection. Here are some of the main ones:

The elements - sun, wind, rain and snow

Make sure you are dressed appropriately for the weather conditions where you're going to collect, to avoid things like sunburn, hypothermia, heat exhaustion and frostbite.

Slips, Trips and Falls

Seed collection involves a lot of wandering around on uneven ground, with hidden logs, holes and slippery areas. Wear suitable footwear (supportive and with tread), watch your step and rest when tired.

A rule for seed collectors, birdwatchers and koala spotters alike - Either look up at the trees OR walk - it's not a good idea to do both at once!

Cuts and scrapes

If you're using secateurs (for example, to trim Eucalypt branches), be very aware of where your non-cutting hand is, keep your cutting hand a good distance away from it and thus avoid snipping your fingers. Wear gloves to protect against cuts and scratches.

Include suitable dressings in your first aid kit - paper tape is ideal for holding cuts together.

Bites and stings

Look out for ants and spiders as you collect, be aware of snakes, and protect against leeches in the wetter areas. Carry suitable first aid to deal with any bites or stings

Respiratory hazards

Many daisies such as Olearia, Cassinia and Ozothamnus, have flurry seed, with tiny detachable hairs that are wonderful for making your nose run, eyes water and setting off fits of sneezing and coughing. The bushes themselves are dusty. A dust mask, or scarf across your nose and mouth, or even a proper respirator mask (looks weird but works a treat) is well worth having.

Most Acacia seeds give off dust or fumes that can trigger headaches, sneezing or even asthma symptoms. This is mainly a concern in the cleaning and storing stages - again, use some sort of mask and/or work in a well-ventilated areas.

Bags and Containers

Depending on what you are collecting, you may need:

- Bucket or tub for collecting into
- Paper bags for small amounts of dry capsules, pods or fluffy seed
- Large, tough bags for bulky material from Eucalypts, Tea-trees and Casuarinas.
- Chook feed bags for Acacia pods, and Olearia (and other daisies)
- Plastic bags for berries, and for collecting plant specimens for identification.

And:

- Seed data collection sheets for labelling seed
- Pen and/or pencil for writing

Equipment

- Pole primers
- Secateurs

4. Collection Ethics

The chances are your aims in collecting seed have something to do with caring for the environment.

The native vegetation you'll be collecting seed from is much more valuable than your future plantation - it is already established, providing habitat for wildlife, and looking after itself.

Basic Principles

1. Leave plenty of seed for foraging animals, and for the plants to reproduce themselves
2. Avoid introducing weeds, diseases or pollutants to natural vegetation
3. Be aware of your impact, and minimise damage from vehicles or trampling - watch your step.

A few rules of thumb

1. Collect no more than 10% of a seed crop in any one year.
2. Leave about half the plants untouched.
3. Make sure seed is mature before collecting.

5. Ready?

Suitable collection site

From the provenance and genetics theory, you should be able to choose suitable places for collection.

Permissions

Organise any permits and permissions before the seed is ready

Preparation

Check the safety and equipment sections to make sure you have everything you need.
Keep your Collection Ethics in your back pocket (ie remember them).

6. Starting Seed Collection

The most effective way to learn seed collection is by doing it, so I will be brief.

More Planning

For each species:

How much seed do you need?

How much seed is on each plant, and what is a tenth (10%) of that?

How many plants do you need to collect from?

If this number is less than 10, and remembering the genetic considerations:

How much seed is enough, from each plant?

7. Timing

Seed Development

I will describe five basic stages of seed development:

Bud

The plant is getting ready to flower, and the pollen and ovary parts (yet to fertilise each other) are reaching maturity

Flower

The pollen and ovaries are ready for action, so the bud has opened up. At this stage, the ovary is still not fertilized

Expired Flower

The flower is looking old, brown or gone, its petals have fallen off etc. At this point, (hopefully), the pollen and ovary have had their fun, the pollen has met the ovary and fertilised it. So we have a fertilised ovule or two inside the old flower - but there is still work to do in developing into a mature seed that can hold its own away from its parent.

Immature Fruit

We may see a pod, or capsule, and start to get excited about collecting seed. This is where we need to learn about the seed development of our target species, because they vary a lot. Acacia pods and Eucalypt capsules will be green and a little soft when immature; most berries will be green, and Casuarina fruits will be brown outside but greening inside. The seed will probably be recognisable if we dissect the fruit, but it will still be dependent on its parent for sustenance, and will simply expire if collected at this stage. If we collect fruit when it is still immature, the seed will be unviable, and our time and the seed will be wasted.

Mature Fruit

Finally, the seed will be ready to be taken from its parent plant, cleaned and propagated. Not only is fertilisation complete, but the ovule has developed into a plant embryo that is enclosed by a hardy seed coat.

8. When to collect?

Some seed ripens very quickly (Daisies, particularly the weedy species), while others can take months (Eucalypts and other Myrtaceae are good examples). Obviously, you need to wait until seed maturity before collecting - and then you have a window of about 2 weeks for most summer-ripening species, and a much longer period for woody fruited species.

Record Keeping

The following information should be recorded (as a minimum) for every batch of seed collected:

1. Species name (Botanical name)
2. Collection location (this should be as precise as possible)
3. Collection Date
4. Number of plants collected from (in terms of "unrelated parents" preferably)
5. Site characteristics, such as soil type, aspect, altitude, position (ie gully or ridge)
6. Name of collector

Seed Storage

Seed should be kept dry (except for fleshy fruits) and at a steady temperature. Storing in an airtight container or bag, in a cool cupboard or refrigerator is ideal.

For more information

Ralph, Murray (1994) Seed Collection of Australian Native Plants, 2nd edition

Florabank at florabank.org.au In particular, check out their guidelines for seed collection.

Keep an eye on seedsofgippsland.net It's still basic, but I hope to put some interesting pages on it in the future.

Seed Collection Opportunities

I will be collecting seed in various places throughout the summer and autumn. There may be opportunities to join me on collection outings where I can show you what I'm collecting, and how, and you can help me collect for a few minutes!

If this type of opportunity interests you, then call me on 5186 1340 or email seedsgippsland@gmail.com.

Jenny Wolswinkel
Seeds of Gippsland

Typical Field record sheet

<i>Stellaria Native Vegetation Service</i>						<i>Seed Collection Data Sheet</i>		
Species					Locality			
Location Description						Collection ID		
Date						D'base number		
Activity	Time reqd	Grid ref.....E		N		Datum		
Collection Hrs	Plants Sampled	Population size		Parents(UMP)			
		Collection area	% cover/area		Fresh Weight	kg	
		Tenure			Est cose		\$	
Notes: (eg. Vegetation type)					Client/project	Invoice/date	Quantity reqd	Remaining
					Designated project			