



Wildlife Notes



DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

No. 4 September 1997

Information Notes for the Land for Wildlife Scheme in Western Australia

Seed collection from native plants

Keywords: seed, selection, picking, seed types, storage, wildflowers.

Location: South-west WA

Authors: Keith Bradby & Vicky Morris

Each picking situation presents its own challenges. Once you have learnt the basic principles, you then have to start using your own ingenuity. Be observant and adaptable, as virtually every plant will require some modification to the general technique of collection. A good guiding principle to seed collection is firstly to obtain the correct license for picking, and secondly to ensure that your actions will not harm the plant from which you are taking the seed, and that the seed you harvest will be usable for your purposes.

SEED SELECTION

You first need to identify the species of flora that you require seed from. This may be through literature or matching up soil types. You then must locate a suitable population of the plant species you are after. This will need to have sufficient seed for your purposes, and be in an area that you can legally pick from. Ideally, collection should be from a decent-sized area of bush if possible with no roadside collection.

The seed needs to be checked for ripeness and for the level of insect attack. For ripeness, cut a fruit capsule or pod open and check the seed for 'firmness', much as you would a grain crop. The level of insect attack will vary, but in many areas where there are few small birds, it is not unusual for most seed to be full of small grubs. This can make it impossible to collect large quantities of viable seed. It maybe worthwhile to note that the most accessible seed is not necessarily the best.

To preserve a broad genetic base in your future plantings, it is important that you get your seed from more than one plant, and pick from as many as possible. It is also important to bear in mind the end purpose of the seed. If it is to rehabilitate a salty area, pick your seed from those plants that are closest to the salt, as they may carry increased salt tolerance. If it is for a garden, some of the plants you are picking from may have a special feature

such as a more attractive "weeping" habit than others, or unusual flower colours. Keep in mind that approximately



80% of the resulting plants will take after the seed-bearing plant rather than the pollen-producing plant, especially if collecting from gardens.

If your purpose is to rehabilitate an area of local bushland, remember that in Western Australia the regional variation within plant species can be considerable, so it is important to pick your seed from similar habitat as close as possible to the area you are intending to replant.

EQUIPMENT

Depending on the nature of the plant you are collecting seed from and the type of collection method you intend to use, there are a few basic tools which will be necessary. A first-aid kit is a must with any activity in case of emergency (for example, some people are allergic to certain types of plants; some plants are very prickly and could cause injury). A container to transport the collected seed will be required, as well as some form of labeling the species collected and the date and area of collection (many species produce similar looking seed). Eye protection, a sieve, a pair of secateurs or pruning saw and perhaps a ladder may be useful when collecting seed-bearing stems. The best results are obtained when the equipment for collection is kept scrupulously clean and serviced, which also helps prevent spreading any infections from one seed source to another. Blunt and dirty secateurs will be more likely to cut you than the plant!

PICKING

Fruit types

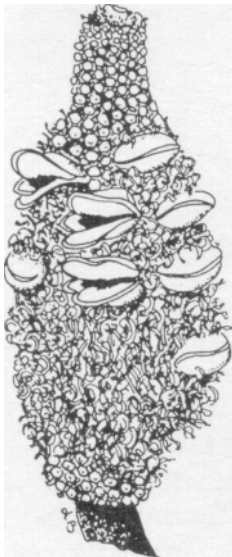
The seed 'container' in the bush has a variety of forms, ranging from large woody fruits (eg. *Hakeas*, *Banksias*), smaller 'nuts'(eg. *Eucalyptus*, sheoak), pods (eg. wattles), or tiny swollen ovaries (eg. *Calytrix*) at the base of shrivelled flower parts.

Successful seed picking generally tries to mimic the natural mechanisms used by the plant to release the seeds from their containers, with the seed ending up where we want it, not where the plant would otherwise spread it.

Based on how they release their seed, most plants fit into one of three main groups:

1. Fire openers - these store the seed for various periods (often several years), only releasing it after the plant is burnt in a bush fire, eg. most *Banksias*, *Xylomelum* spp, and some *Hakeas*.
2. Drying openers - these can hold the ripe seed for extended periods, but eventually the fruit dries out and the seed falls, eg. *Eucalyptus* spp, *Melaleuca* spp.
3. Once-a-season producers - these drop their seed (or sometimes throw it!) once the seed has ripened after flowering, eg. *Anigozanthus* (Kangaroo Paws), *Acacias*, *Kennedias*.

1. FIRE OPENERS



Banksia attenuata
Slender Banksia



Winged Seed

The most obvious of these is the *Banksias*, which have a woody cone with numerous follicles (the woody seed-containing 'eyes') which, when cracked by heat, open to release two winged seeds and a central woody separator. The seeds are ripe about twelve months after flowering - look for fruits where the follicles are hard and brown.

The easiest way of collecting the seed from fire openers is to follow a fire, picking the fruits (cones) as soon as possible after the fire has passed. This method is not generally recommended for the average casual picker as hazards in the form of ash beds do occur! It is generally best to get the seed within 24 to 48 hours, depending on weather conditions. (It will drop faster in higher temperatures). Care should be taken, however, to ensure sufficient fruit are retained on the plants for regeneration after the fire. It is recommended that only 1 in 10 fruit are harvested after fire.

Banksia fruit can also be piled into a heap (1-2 bags per heap) and soaked with approximately 3-5 litres of mixed kerosene and sump oil and set alight to create the heat required to open the follicles. When alight the heap should be turned with a rake. It must be noted, however, that temperatures over 60 degrees Celsius are destructive to seed, so as soon as you notice the follicles start to open remove the cones from the heat.

The aim is to evenly subject each nut to intense flash heat. Have a hose handy to thoroughly wet the nuts after the follicles have cracked. And be careful, singed eyebrows regrow reasonably fast, but singed skin is painful and the scars can be permanent!

Whether collected burnt, or burnt after collection, only a certain amount of seed falls out straight away. The fruits generally require a period of successive wetting and drying before they drop all their seed.

As long as the weather is not too cold or wet (ie. for more than two days), the best method is to place the fruits outside on a well drained surface which will hold the seed. Most seed should be out within 3-4 weeks - the rest probably isn't worth bothering about. Possibly the best surface for drying on is shade cloth as it lets the moisture, dust, and ash, but not the seeds, through.

During wet periods the nuts could be spread in the warmest part of your shed, and shifted out into the rain for a day every few weeks.

It is also possible to remove seed in a microwave oven, but it is easy to 'cook' and so kill them, therefore this method is not recommended.

Other bushes burnt to collect the seed include *Dryandras*, *Petrophiles* and *Isopogons*. Fruiting heads can be laid on the ground and given a thin spray of petrol. The leaves often provide much of the heat once they are started, and you need to wet them down before the fire affects the seed.

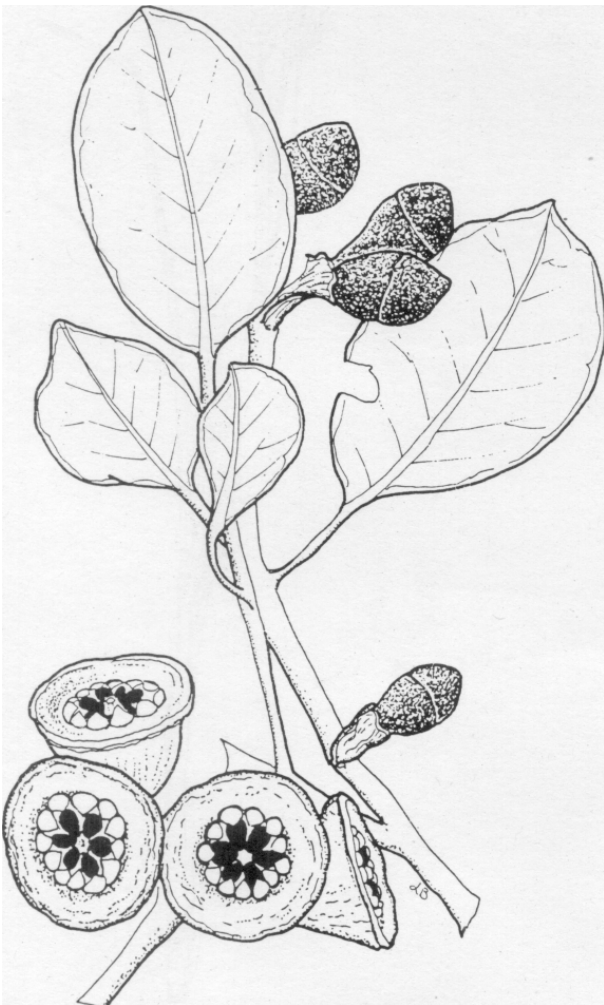
2. DRYING OPENERS

The main types of these are the smaller woody fruits that open from central valves to release a much finer seed, such as *Eucalyptus* spp, *Allocasuarina* spp and *Melaleuca* spp, and the woody fruits which split to release two seeds, such as *Hakeas*.

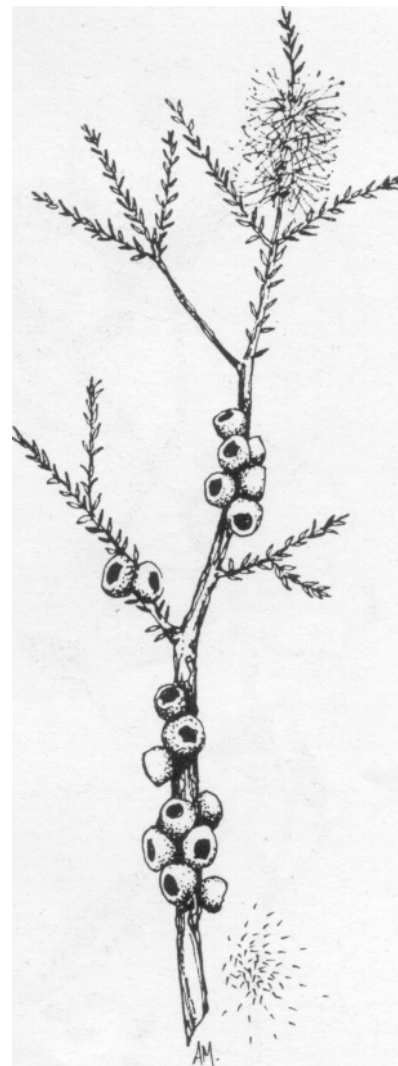
They generally ripen about 12 months after flowering, although some species can take 2 - 3 years to mature, such as *Callistemon phoeniceus*, which may contain several years' seeds along their stems. The fruit hardens, generally loses its green colour, and the valves, or join, becomes clearly defined. The seed can be checked for dryness and good colour by cutting through the "nut".

To release seed, place stems and branchlets holding ripe fruit on a tarpaulin in a warm dry place. If drying the fruit outside, the use of fine weed mesh is good insurance because if it rains, the moisture will drain away. The seed will drop within 3-4 days in summer, longer in cooler weather. Ensure that strong winds cannot blow away the released seed. Note that no heat treatment is required for this group, which also includes *Kunzeas*, *Grevilleas* and *Hardenbergias*.

Remember to leave at least two thirds of the fruits on each plant for natural regeneration.



Eucalyptus preissiana
Bell-fruited mallee



Melaleuca brevifolia
Dwarf salt honey-myrtle

3. ONCE-A-SEASON PRODUCERS

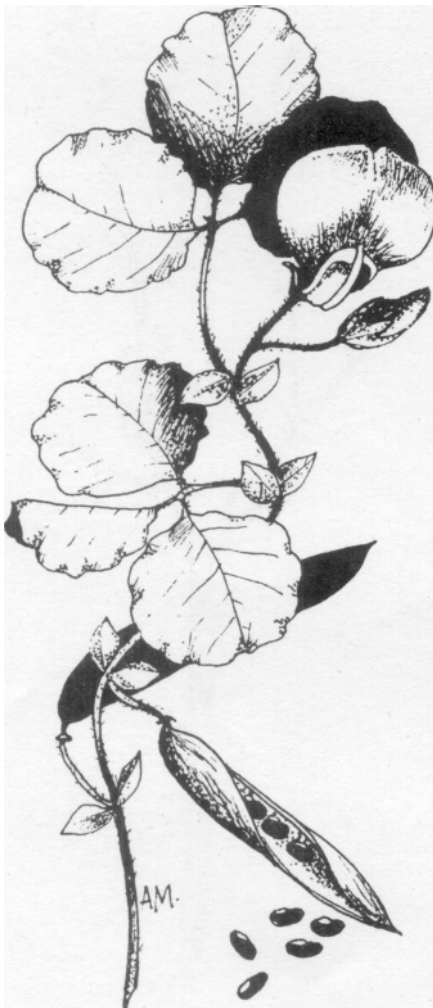
These are often the very hardest to collect seed from. Most of these plants make up the spring profusion of flower and drop their seed between the middle of October and the middle or end of January. Although there are many, many different types of fruit and seed release mechanisms involved, which you can never completely work out, the basic principles are reasonably simple.

You generally have to try to assess when the seed will be ripe. This requires regular checks on the ripening progress. It's a skill you will only get better at with experience.

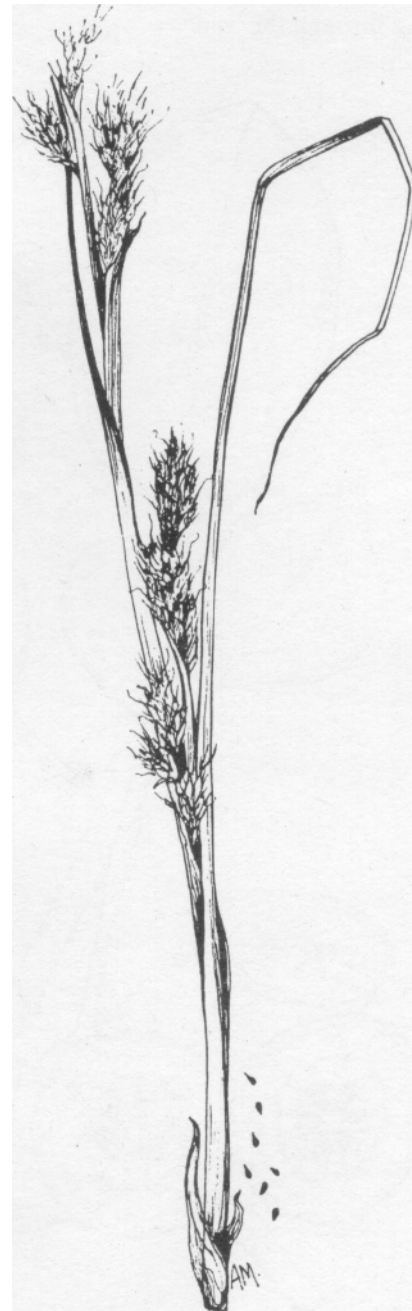
Generally cool weather means seed will ripen slowly, but beware of those few hot days toward the end of December and the New Year, particularly if it's also windy.

The seed can go from green, to pickable, to lying on the ground faster than you thought possible, and generally all the species you are trying to pick will choose the same hot spell to ripen.

Even under reasonable conditions, patches of a species will often ripen unevenly. On the same plant seed can be ripe, ripening and green. You have to make a judgment on the best time, but generally 'later' is better. Early ripened seed is often unviable. Green seed should be left on the bush for regeneration of the species irrespective of the ripeness, some seed should be left on each plant that is harvested from.



Kennedia prostrata
Running postman



Gahnia trifida
Coast saw-edge or cutting grass

The main picking methods are:

Tarping

Many seeds and pods can be shaken off the bush when ripe. Spread tarps underneath, and either shake the bush or hit the pods with a stick or a piece of flexible pipe. A garden rake is often useful for combing the pods off. Depending on the species, tarping can generally only be done after the morning dew has dried off and, with the larger trees, before a breeze or a wind comes up. This is quite often difficult to do, as the wind often blows away the seed or the tarp! A few heavy rocks may help keep the tarp in place.

Binning

Smaller bushes can often be stripped by hand into large plastic rubbish bins.

Stem cutting

Often wattles and similar plants grow too close to the ground for tarping. In this case, stems holding ripe seed need to be cut and laid on a mesh, where the seed can be threshed off by walloping them with a pitchfork. Note that only seed bearing stem ends should be cut, and some leaves left on the plant below the cut to assist regrowth. No more than a total of 30% should be removed from any one plant. This ensures that sufficient stems with leaves remain on the plants to enable them to recover.

Some plants, such as *Kennedias*, ripen very unevenly. When some pods are ripe the stems can be cut and laid in a cool place (often under shade cloth) and many of the remainder will ripen by drawing on the moisture in the stems. Seeds that 'pinch out' are unviable and can generally be winnowed out.

Stem cutting is often also the most effective way to collect small fruit. Occasionally, as with kangaroo paws, the seed pod is collected when it starts to open, but then 'freezes' and won't open to release all the seed. The fruits need to be dried thoroughly, and then crushed to free the seed. This can be done by hand, by placing the pods on a concrete floor and walking over them, or by running them through a small thresher.

Desperate measures

If you got to your patch too late, then don't despair. With wattles and other plants with large hard seeds it is sometimes possible to sweep or shovel the seed off the ground, so that the dirt and leaf litter can be sieved out. Small battery-operated vacuum cleaners may prove useful for this task.

DRYING, CLEANING AND STORING

For much of the year drying can be done outside, and moisture from any rain or dew helps the fruit 'work' the seed out. Any clean surface will do to dry your seed on. The most effective is the rolls of woven polythene weed mesh, which retains the finest seed, but lets any rain or moisture through (plastic bags are NOT appropriate).

The stems or pods should be spread reasonably thinly on the mesh or tarpaulins, and turned every few days. Extreme care should be taken to ensure that the mesh or tarp is secured down against strong winds, and that sand and dust will not be blown or walked onto tarps holding fine seeds. Some pods, such as *Kennedias*, need shade cloth or fly wire over them to stop the seed 'pinging' everywhere as the pods explode open.

Even when it is on your tarp there can be a bit of competition for the seed. Ants are often very appreciative of your effort in bringing so much seed to a convenient point for them, and you may need to shift the seed, or spread an ant deterrent, or spray a surface insecticide around the tarp. Occasionally some birds will browse over your pods, but these are rarely a cause for concern, unless it is a mallee fowl on a tarp of its favourite wattle.

Once the stems or pods have been removed, the remaining material can be hand sieved, which generally requires a number of different sized sieves. Light material can generally be winnowed out (*a la* peasant grain cleaning techniques). With a number of species, such as *Banksias* and *Dryandras*, the seed will sink if placed in water, and much of the other material can be skimmed from the top of the water.

If the seed is for a local revegetation project using the direct seeding method it does not need to be very clean, unless you want to know the weight to use per hectare. However, be warned that seed mixed with other material soon becomes bug infested. Producing a perfectly clean seed sample can be quite laborious, and is only really necessary if you want to sell the seed, or store it for an extended period.

Before storing seed, even if only for a short period, make sure that it is perfectly dry. If possible, spread a thin layer over a tarp or metal tray and leave in a warm position for a day or two.

Clean seed will keep for varying lengths of time if stored properly and regularly checked. Many species will last quite a few seasons, however some species of *Grevillea* will not. Store seed in a rodent-proof, dry, almost airtight container in a cool, dark and dry place (even your fridge). A small piece of Shelltox pest strip, renewed every six months or so, will kill any bugs that may appear.

If you are selling seed (for which you will need a license) it needs to be perfectly clean. Some seeds clean relatively easily, others need machine cleaning or even picking through by hand. If selling to a seed firm, discuss this with them, as they can probably arrange the final cleaning for you.

Cleaning up

Using the simple approaches outlined in this leaflet, it is possible to collect quite large quantities of seed. In doing so, you will also collect a much greater amount of stems or pods. Even after you have taken most of the seed away, these will still contain seed, and can be quite useful for regeneration.

If tarping on site, the residue should always be spread thinly over the site, so that it does not become a fire hazard. Wherever possible, the residue (and your screenings) should be spread over the area you are regenerating, as it will provide useful ground cover, and organic matter, as well as adding some extra seed.

RULES AND REGULATIONS

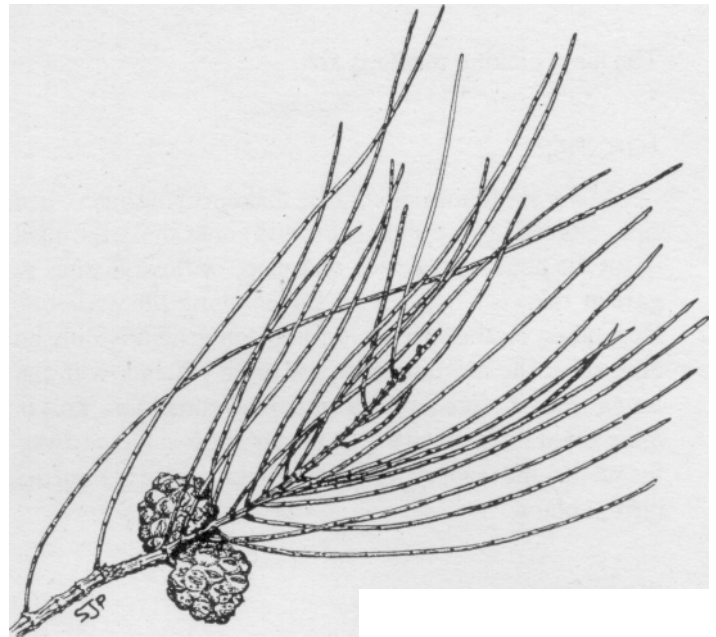
by Sarah McEvoy

The laws governing flora conservation are contained in the Wildlife Conservation Act and its regulations, which are administered by the Department of Conservation and Land Management.

Flora native to Western Australia is protected under this Act, which means that regulations exist regarding the harvest of that flora. Certain flora that is considered to be threatened with extinction is declared as rare flora under the Act, and such flora is given special protection, and may not be harvested without the permission of the Minister for the Environment, on any lands.

Protected flora other than declared rare flora may be harvested for seed as specified below. On Crown land seed can only be taken where the person taking the seed holds a license issued by CALM. There are two types of Crown land licenses which may apply to people wishing to harvest seed. A Commercial Purposes license is required if the flora is to be taken for a commercial purpose (which would include minesite rehabilitation, or any circumstance where the seed picker obtains any gain, either direct or indirect, from disposing of the seed). The fee for this license is \$100.00 per annum.

Where the harvesting of seed is for non-commercial propagation, such as local rehabilitation by a community group, a Scientific or Other Prescribed Purposes license can be obtained. The fee for this license is \$10.00 per annum.



Allocasuarina fraseriana

Common sheoak

Even when a license is held, all pickers must obtain the permission of the land manager before picking in any vested Crown land (eg, State Forest, Water Reserves, etc). Both the Commercial Purposes license and the Scientific or Other Prescribed Purposes license generally preclude the taking of flora from the conservation estate - ie, National Parks and Nature Reserves.

On private land, protected flora can only be taken by the owner or occupier of the land, or by a person who has the owner or occupier's consent to take the flora. If the flora is to be sold, the owner or occupier must hold a Commercial Producer's or Nurseryman's license. The fee for this license is \$25.00.

Further specific conditions are attached to each license and are designed to ensure that sustainable harvesting occurs. For further information about licensing contact CALM's Wildlife Branch on (08) 9334 0455.

About the Authors

Keith Bradby and Vicki Morris have collected seed commercially and for use in revegetation projects for many years.

Sarah McEvoy is a consultant ecologist, who formerly worked for CALM as Flora Industry Botanist.

Diagrams by

Anne Miles from What Seed is That, Greening Australia (South Australia)

Louise Burch from Banksias of the Wellstead District and Eucalypts of the Wellstead District, Wellstead Land Conservation District Committee. Margaret Pieroni and Sue Patrick from 'Leaf and Branch', Trees and Tall Shrubs of Perth, CALM. Used with permission.