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013801



Information Sheet No. 5-87

Department of Conservation and Land Management
May, 1987

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Native Seed Collection and Storage

1. Introduction

This outline of techniques and equipment necessary to successfully collect seed from the major genera of local flora is intended for those who wish to make their own collections and store surplus seed for future use. Most seed is relatively easy to collect providing the basic principles outlined here are followed. Permits are required to collect seed for:

- (a) Commercial purposes;
- (b) From areas of Crown land.

Collection is not allowed in national parks, nor can gazetted rare species be collected anywhere. Contact the Department of Conservation and Land Management for full details.

2. Flowers and Seed

Generally, good seed years will produce the best quality seed. Many native trees and shrub species, however, do not flower or produce a seed crop with equal regularity each year. This requires the phenology, or time sequence, of the entire reproductive cycle to be understood so that good seed crops can be predicted and preparations made to coincide seed collection (or regeneration work) with a good seed year.

To identify potentially good seed crops note and record where a patch of the desired species is flowering heavily. This is particularly useful when dealing with species with spectacular flowers (e.g. wattles) or very tall species (e.g. eucalypts). After flowering, and provided fertilisation has taken place, seed will begin to mature in the fruit. A good crop of seed following heavy flowering can be upset by sustained cold windy weather and sudden drought, which will cause flower deaths, or even the lack of birds or insects to complete the pollination process. Constant observation of the progress of the plants is necessary.

3. Seed Collection

The amount of fruit collected should be geared to the collector's short term need for seed, as fresh seed is most viable. A few ripe fruit will often supply enough

seed for the average collector who wishes to raise seedlings for his own property.

Before any collecting the collector MUST (1) know the approximate time(s) of the year when ripe fruit of the species can be picked and (2) be able to recognise ripe fruit.

To provide an introduction to these topics we have divided the fruit of various species into two major groups: species with persistent woody capsules or fruit; and species which shed seed annually. It must be noted, however, that within a genus there is variability. The collector MUST observe the plants and note the characteristics of each species. For example most species of the *Grevillea* shed their seed in two to four months but *G. glauca* and *G. annulifera* retain the seed until the parent plant dies or the branch is severed. Generally *Banksia* spp. retain their seed for many years, however *B. coccinea*, *B. dentata* and *B. integrifolia* shed their seed annually.

Species with persistent woody capsules or fruit

Species that retain woody capsules or fruit on the parent plant for a long time and release their seeds after some stimulus such as high temperature, the branch being severed, or the parent plant's death. Some examples are species from the genera *Banksia*, *Callistemon*, *Eucalyptus*, *Hakea* and *Melaleuca*.

With the *Myrtaceae* family (*Eucalypts*, *Melaleucas*, *Callistemon*) the first indication of ripeness is the dark colour and woody texture of the fruit. In addition, on *eucalypts* and other *Myrtaceae* with large fruit, the valves — at the top of the fruit — turn brown and begin to separate when the fruit is ripe. Most of the *Myrtaceae* family carry a series of fruit crops at different stages of ripeness and the ripe fruit are further back on the branch. Check the valves are not already open and seed dispersed.

For the majority of these species, seed can be collected nearly all year, however it is advisable to collect during the warmer months when fruit can be air dried to extract the seed.

Species which shed seed annually

Species which shed all their seed annually, do so after a relatively quick ripening period and the seed itself is shed over a relatively short period of time. Examples include many of the understorey species such as the native legumes (e.g. *Acacias* and *Kennedias*).

The majority of this category, depending on the species, shed their seed between October and December. As the green pod colour changes towards brown and the texture becomes drier and more brittle, the seed matures. At this stage very careful observations must be maintained as one hot day in early summer can 'pop' most of the seed on the bushes.

4. Collection

When the fruit is ripe, either individual fruits or heavily laden small branches can be removed, making sure the minimum of damage is done to the parent plants. Collect fruit off the tree as those on the ground are generally empty or will have been attacked by insects or fungi. Place in bags (either paper, cloth or wheatbags), plastic rubbish bins or in the back of a ute for transport to a central area for the extraction of the seed. Do not use plastic bags.

4.1 Equipment and collection techniques

The techniques and equipment used to collect the ripe fruit depends on the amount of seed required and the height of the fruit above the ground. Fruit from the majority of low growing species is relatively easy to collect using secateurs or pruning equipment available in most hardware stores. Gloves may be required.

Tall trees require special equipment and techniques to avoid destroying the parent plants. These include:

- Extendable pole pruners or pole saws (to 3 m in length), and/or a sturdy, stable ladder brings the crowns of many smaller trees and shrubs into reach.
- Throw a rope over small branches and snap them off. For the serious collector a 'commando-saw', a length of flexible saw with ropes on either end, can be used to a height of 10 m. This method requires some skill in positioning the saw. Horizontal branches are easier to saw than those with acute angles of incidence with the tree.
- Collecting from very high trees is hazardous and should only be done by experienced people who have proper safety equipment.

5. Extraction

The method used to separate seed from the fruit of various native species depends on:

- (i) the climatic conditions which prevail where seed is to be extracted;
- (ii) the characteristics of the seed or fruit of each species; and
- (iii) the size of the collection.

The most economic methods of extraction for most species are:

- (a) Air drying, particularly in the drier areas of WA and during the warmer months of the year.

- (b) Oven extraction, in areas of high humidity.

5.1 Air Drying

Large collections:

Place large collections of fruit or branches on a canvas tarpaulin or plastic sheets in a well-ventilated position of partial sunshine (e.g. in a shearing shed) until the seed is shed. In warm weather direct sunshine will overheat the fruit and kill much of the seed. Most species will shed their seed within 7 to 21 days. Wait until most of the fruit has opened or split, then shake the branches to dislodge all remaining seed. Remove empty fruit and branches. Put the seed in paper or cloth bags.

Small collections:

Place the fruit in ventilated containers such as paper or cloth bags. An open plastic container can be used provided capsules are spread out evenly over 2 to 3 layers, thus allowing for air to circulate between the fruit.

5.2 Oven Drying

When humidity is high, put lots of capsules into strong paper bags before placing in a kitchen stove at about 60°C. The door of the oven should be partially open, depending on initial heat of the oven. Capsules can be left overnight and removed in the morning.

For bulk collection extraction in humid localities large drying ovens are required.

5.3 Special Treatments

Special treatments are necessary for extracting the following groups of species:

BANKSIA: Place the cones in an oven at 80-90°C or scorch the cones in an open fire. Immediately after the heat treatment submerge the cones in water. Allow to dry. If the follicles are open wide, vigorously jar the fruit to remove seeds. If follicles are still closed, repeat procedure.

DRYANDRA AND HAKEA: Place the fruit in an oven at a temperature of 80-90°C. The seed will be released if it is fully mature. Do not exceed these temperatures as high heat will damage the seed. *Hakea* species hold their typical black, winged seeds strongly within a woody fruit, which will require more than the usual drying time to release seed.

SOME LEGUMES: Some species of legumes such as carob beans and a few *Acacias* hold their seeds tightly within their pods. It may be necessary to pass the *Acacia* fruit through a hammer mill or, in the case of carobs, soak them in water before the seed can be separated. Screen the softened carob mass and dry the seed. An alternative is to soak the carob pods for 24-48 hours until the pod softens, then use a knife to open the pods and extract the seed.

CLEAN THE SEED: Following extraction of seed from the capsules or fruit, some cleaning may be needed to remove fragments of leaf, small twigs, empty capsules or dust and soil particles.

To remove these impurities pass the sample through suitable screens to separate the seed.

6. Seed Storage

Essential matters in seed storage are:

- (i) Moisture content;
- (ii) Temperature of storage location;
- (iii) Storage containers;
- (iv) Insect infestation.

6.1 Moisture content

Generally, moisture contents should be in the range of 4 to 8 per cent and stabilised. Under normal conditions air-drying and oven-drying extraction usually result in suitable seed moisture content. If in doubt, dry the seed further in a warm, shaded and dry area.

6.2 Storage temperature

Once seed has been placed in storage containers, it should be put in a cool and dry area where fluctuations of temperature and moisture are kept to a minimum.

6.3 Storage containers

Press-in lid tins or plastic jars with screw top lids ensure a good seal, which reduces escape of gases and moisture content changes.

To minimise the amount of air in each container, fill to capacity with seed. The size range of containers available is wide and should be selected in keeping with the size of the collection.

Labelling seed lots is vital for later identification and should include species' name, date collected, locality details and seed viability results. Place a duplicate label inside with the seed, as the outside label can become defaced or lost.

6.4 Insect control

Insect control is an important consideration. The Department of Conservation and Land Management use 'Dryacide' to exterminate insect pests in seeds. However, this is only available in a minimum 15 kg bag. An alternative is to dust with an insecticide powder or a combined fungicide/insecticide powder available from most stores. A light application is all that is required. Frequent checking

of stored seed lots monitors insect attack and moisture content changes.

6.5 Seed viability testing

Viability varies with age, storage conditions and with the maturity of the seed. Test the seed on collection and, if stored for some time, before use. With large seeds such as Acacias use 30 seeds for testing. With fine seeds use a small pinch of seed. A small pinch of seed is about 0.2 g.

A simple procedure to test seed involves:

- (a) Place a fine grained sponge on a saucer of water.
- (b) Place or sprinkle the seed sample on the sponge.
- (c) Keep the sponge moist and in a warm place. A temperature of 20-25°C is required.

Viable seed will germinate in about 14-28 days. By simple calculation you can now determine the number of grams or kilograms of seed you will require to grow a certain number of plants.

7. Useful Equipment for Seed Collecting

1. Large strong plastic sheet/tarpaulin, about 3 m x 4 m.
2. A range of garden sieves (2 mm-12 mm screens).
3. Large bags or rubbish bins for holding capsules and seed at COLLECTION time. Not for storage.
4. Secateurs and pole pruner.
5. Sturdy stable ladder (2 m-3 m).
6. Gardening gloves—remember some plants have thorns.
7. A range of airtight containers up to 2 litres.
8. Labels: for bags of capsules.
for sticking or tying on the outside of storage containers.
for inside the storage container.

Compiled by CALM Advisory Service.

Further information is available from advisers based at Como, Narrogin, Geraldton and Esperance offices of the Department.