Sutherland Group
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Notes on Propagation by Seeds and Cuttings

These notes were written by Ron Stevens of the Society for Growing Australian Plants (Sutherland Group) in July 1978. They have been retyped in May 2012. Some species listed may not be commonly available now or may have had a name change.

Part 1 – Seeds

The ripened seed has its water content almost to a minimum resulting in the suspension of its activities. In this condition, it is able to withstand extremes of temperature which would be fatal after it had taken up water. How long seeds retain their power of germination is not known with certainty. Seeds can absorb moisture even from the air, so it is essential that they should be kept under the driest conditions when stored. Seeds which have been kept in the dark and out of contact with the atmosphere will germinate at an age impossible with seeds exposed to light and air. Generally speaking, the longer seeds are kept, the lower will be the percentage of germination, and less the vigour of the seedlings.

Seed collection

Ripened seeds are in three groups:

Group 1 – Seeds that remain on plants

Banksia, Callistemon, Calothamnus, Hakea, Leptospermum, Melaleuca, and Regelia (exceptions are *Banksia integrifolia*, *Callistemon viminalis*, and *Callistemon acuminatus*).

When collecting seed pods that remain on the plant, always collect the lowest pods on the plant. Place the pods in a paper bag in a sunny position. The pods will open and the seeds fall into the bag. Banksia cones are best held over a naked flame or placed in a hot oven. The heat will cause the cone to open and the seeds can be collected.

Group 2 – Seeds expelled from the plant

Most of the native plants are in this group, so you must keep these plants under observation when they set seeds. Pods may be green today and ready to open tomorrow.

Group 3 – Seeds that fall from the plant

Christmas Bush and Persoonia.
Collect seeds from these plants as soon as they change colour.

Collection

Always ensure that seeds are ripe when collecting them. Often with seeds that are expelled from the plant, although they may develop seed containers these may contain no seed or only a few develop. Quite often they are subject to insect attacks and in some cases all the seed may be destroyed. Gompholobiums are phone to such attacks.

Germination

Before germination can take place, seed requires moisture, air and warmth. It is necessary for the moisture to pass through the seed coat before germination can begin.

When the seed coast is thin and soft, germination occurs readily but moisture cannot penetrate seeds that have a hard outer shell. Under natural conditions, these seeds remain dormant until the hard shell is damaged by decay, abrasion or fire.

So some seeds require treatment before sowing and they fall into three groups.

Group 1 – Seeds requiring soaking overnight, abrasion, rubbing between 2 sheets of coarse sandpaper or nicking the outer cover with sharp knife or razor blade

Among these are Acacia, Bossiaea, Brachysema, Burtonia, Cassia, Chorizema, Clianthus, Darwinia, Davesi, Dillwynia, Gompholobium, Goodia, Gossypium, Hardenbergia, Hibiscus, Hovea, Indigofera, Jacksonia, Kennedia, Mirbelia, Oxylobium, Pavonia, Platylobium, Pultanea, Swainsonia, Templetonia, Viminaria, Anigozanthos (bicolour, rufa and pulcherrima).

Group 2 – Seeds requiring cover with dry leaves, setting alight and keeping alight for 5-10 mins

If possible, use soil from the area where growing for sowing. Group 2 seeds are frequently infertile and germination may be poor. Burning may destroy some of the seeds but will crack the hard shell of others and allow moisture to enter and the seed to germinate.

Such seeds include: some of the Boronias, Correa, Crowea, Eriostemon, Leucopogon, Persoonia, Phebalium, Philotheca, Ricinocarpus, Styphelia, and Zieria.

Group 3 – Seeds taking up to 12 months (but sometimes only 4-6 weeks)

All of these seeds need abrasive treatment before sowing, except Eremophila which should have the fleshy or bulbous outer layer removed and the woody case rubbed between two sheets of coarse sand paper.

They are Conospermum, Darwinia, Eremophila, Isopogon, Micromyrtus, Myoporum, Petrophile, Pileanthus and Thryptomene.

Finally, some of the seeds that do not require treatment before sowing:
Actinotus, Anigozanthos (manglesii, flavida, humilis, viridis), Baeckea, Beaufortia, Brown Boronia, Callistemon, Calothamnus, Christmas Bush, Conostylis, Everlastings, Epacris, Eucalyptus, Hypocalmna, Isotoma, Kunzea, Leptospermum, Lobelia, Melaleuca, Melastoma, Regelia, Sprengelia, Stylidium, Wahlenbergia, Woolsia.

Time

In the Sydney region, I find the best time to sow seeds for quick germination is September and October, or March and April, with Waratahs in August, Anigozanthos in September, Christmas Bush and Actinotus in January, Everlastings and Hypocalymna in March, Brown Boronia in September.

Part 2 – Cuttings

Next to seeds, cuttings provide the best method of propagating large numbers of plants. They are of special value in perpetuating strains or varieties of plants that cannot be relied upon to come true from seed.

Stem cuttings are generally used and may be taken as:
Softwood – new growth
Medium wood – new shoots 6-8 weeks old
Hard wood – 18 months or older
Heel cuttings – sideshoots with a heel left on them.

Cuttings should only be taken from healthy plants, never from diseased or starved plants. Some people believe only non-flowering shoots should be used for cuttings, but with many species better regeneration takes place when cuttings are taken just prior to or just after flowering. This is the period when the sap is flowing freely within the plant and the best time to take cuttings. They can of course be taken at any time of the year but will take longer to form roots.

With plants that are easily rooted from cuttings, age of the plant makes no difference. But age in the more difficult subjects can be an important factor, with these cuttings taken from young plants will root more easily than those from older plants.

The type of material used to make cuttings varies from plant to plant. Some are propagated from young tips, others from old shoot. Experimenting answers this.

Growth

All plant growth is controlled by growth substances, some of which have the function of controlling and stimulating root formation. A number of synthetic substances have been found capable of stimulating root formation and now commercial preparations containing various combinations of these synthetics and agitators are on sale: Seradix with powers for soft, medium and hard woods, also Lanes All Purpose Hormone Cutting Powder.

In the past, it was thought that only heel cuttings or cuttings taken at a node with a clean cut just below the node and planted immediately were successful.

However, with the hormone rooting powders, even internodal cuttings can be successful. Some people do not believe in the use of cutting powders and certainly cuttings will root without it, but chances of success are greater by using them.

Plants are extremely variable in their ability to form adventitious root systems. In some, it is virtually impossible to induce them to do so, while in others it is no problem.

The ability of a plant part to make a successful cutting depends upon the ability of cells within it to change their function – divide and produce new cells, which in turn will form new organs which are capable of forming adventitious or abnormal roots. This operation comes from the cells of the cambium layer.

When a cutting is taken from a plant, the active cells form a protective tissue or callus at its base, which is the forerunner to roots. Inside the cuttings there is food stored and soil waters on which the cells live; obviously the time this will last is limited. It also has to combat transpiration so it is essential to get it into the propagation medium as soon as possible.

Unless the cutting is able by the formation of new roots to obtain fresh supplies of soil water and so become self-supporting, starvation sets in. So the maintenance of adequate water supply to the tissues of a cutting while it is forming new roots is of the utmost importance.

Also the water supply to the leaves from the roots has been cut off, and the cuttings can lose water by transpiration. To avoid the cuttings drying up and dying before rooting, two measures are taken. Firstly, reduce the number of leaves to a minimum, leaving only the young ones. This ensures adequate production and translocation of food and growth substance and also reduces the leaf area from which water may be lost.

The second measure involves maintaining a high humidity around the aerial parts of the cuttings by various propagation methods such as cold frames, hot boxes etc.

Propagating soils and mixtures are many and varied. I use coarse washed sand for most species and if possible soil from the area for waratahs, *Boronia serrulata* and *Crowea saligna*, leaving it unwashed. Another good mixture is coarse sand and bush soil mixed 50/50, which is good for *Crowea exalata* and some of the grevilleas.

Time for cuttings

Cuttings can be planted any time of the year but below are my observations of the best time of the year.

January	*Callistemon* 'Captain Cook' *Epacris longiflora* (planted under bottle) *Leschenaultia* all species Waratah (use soil from around plant itself)
February	*Callistemon* 'Captain Cook' *Grevillea lavandulacea*
March	*Boronia crenulata* *Boronia denticulata* *Boronia heterophylla* *Correa reflexa* *Correa manni* *Correa* Mann's hybrid *Crowea exalata* *Darwinia rhadinophylla* *Grevillea asplenifolia* *Grevillea lavandulacea* *Grevillea juniperina prostrate* *Grevillea longifolia* *Grevillea* 'Robyn Gordon' *Grevillea thelmanniana* *Leschenaultia* various *Pimelea decussata* *Prostanthera* *Scaevola*
April	*Boronia anemonifolia* *Boronia chandleri* *Boronia cymosa* *Boronia crenulata* *Boronia deani* *Boronia denticulata* *Boronia filifolia* *Boronia frascri* *Boronia heterophylla* *Boronia lutea* *Boronia megastigma* *Boronia mollis*

	Boronia polygalifolia *Calytrix tetragona* *Correa* all species *Darwinia citriodora* *Eremophylla maculata* *Eutaxia obovata* *Grevillea alpina* *Grevillea* Golden Alpine *Grevillea punicea* *Grevillea rankinsi* *Hypocalymna angustifolia* *Melaleuca incana* *Melaleuca pulchella* *Thryptomene saxicola*
May	*Correa* all species *Epacris longifolia* (in situ under bottle) *Eremophila* *Leschenaultia* all species
June	B*eaufortia purpurea* *Boronia crenulata* *Boronia cymosa* *Boronia heterophylla* *Calytrix tetragona* *Correa* all species *Crowea saligna* *Darwinia citriodora* *Darwinia collina* *Eremophila* *Eutaxia obovata* *Grevillea biternata* *Grevillea lanigera* *Grevillea juniperina rubra* *Grevillea thelmanniana* *Hypocalymna angustifolia* *Kunzea calida* *Kunzea ericifolia* *Kunzea preissiana* *Kunzea* WA species *Leschenaultia biloba* *Melaleuca thymifolia* *Melaleuca platycalyx* *Pimelea decussata* *Prostanthera* *Thryptomene saxicola* *Verticordia densifolia* *Verticordia plumosa*
July	Nil
August and September	*Bauera rubioides* *Boronia filifolia* *Boronia crenulata* *Boronia cymosa* *Boronia serrulata* (own soil) *Beaufortia purpurea* *Calytrix sullivani*

	Calytrix tetragona *Chorizema* *Crowea saligna* *Eremophila maculata* *Eutaxia obovata* *Grevillea baueri* *Grevillea lutea* *Grevillea punicea* *Grevillea* Crosbie Morrison *Grevillea* Poorinda Queen *Grevillea* Golden Alpina *Hypocalymna angustifolia* *Hypocalymna robustum* *Melaleuca incana* *Melaleuca megacephala* *Melaleuca platycalyx* *Melaleuca pulchella* *Prostanthera cuneata* *Prostanthera incana* *Prostanthera ovalifolia* *Prostanthera* 'Poorinda Leanne' *Prostanthera rosea* *Prostanthera stricta* *Prostanthera violacea*
October	*Correa aemula* *Correa backhousiana* *Correa bauerlennii* 'Chefs Cap' *Correa calycina* *Correa* Cains hybrid *Correa* 'Lakes Entrance' *Correa decumbens* *Correa glabra* green *Correa glabra* yellow *Correa* lime yellow *Correa manni* *Correa pulchella minor* *Correa pulchella var rubra* *Correa reflexa angelsea* *Correa turnbulli* *Waratah* (own soil)
November	*Hypocalymna robustum* *Leschenaultia* all species Waratah (own soil)
December	*Callistemon* 'Captain Cook' *Grevillea* 'Robyn Gordon' Waratah (own soil)