



PLANT PROPAGATION TIPS

FACILITIES & MATERIALS

The basics that you need to propagate plants successfully are access to water and a place to leave the plants that is not in direct sunlight and can be maintained securely and hygienically.

Propagation structures: a raised area under shade cloth provides the best facility for initiating germination in plants. The percentage of the shade cloth is ideally 70%, A hot house system which isolates the plants from the outside environment is ideal for cuttings, and starting fine seeds. Having these structures will greatly expand your ability to germinate seeds and strike (root) cuttings.

Areas to be used for propagation need to be kept isolated from sources of infection. They need to be maintained by sterilising surfaces with a 1% bleach solution, on a regular basis.

Watering systems: can be a watering can, hose, or an automated system. The advantage of the first two methods is that they are very efficient in delivering the water only where required. They do take time though. The advantage of an automated watering system is that it provides less stress and demand on your time; it waters at regular intervals and requires minimal effort. The disadvantage is that it is wasteful of water falling in areas where it is not of benefit to the plants that you are trying to grow.

When seeds are initially sown they require watering once or twice a day, they can never be allowed to dry out. When growing from cuttings, watering needs to be multiple times per day, in order to keep foliage and growing media moist.

Potting mixes: need to be free of diseases and weed seeds. Ideally they should be prepared hygienically so that there are no fungal diseases affecting the plants. Methods of obtaining a sterile potting mix include: steam sterilisation, or purchasing nursery industry association standard potting mixes from commercial enterprises. Some materials used in propagation do not require sterilisation such as perlite, vermiculite, and fertilisers.

Fertilisers: If you are hand watering liquid fertiliser is a good alternative. If you are using an automated system, then you need pelletised slow release fertiliser.

Containers: need to be new or sterilised with 1% bleach to 99% water solution, soaking for an hour will sterilise a container. Containers need to be set out on mesh off of the ground to prevent diseases in the soil from entering.



SOURCING PROPAGATION MATERIAL

Provenance sourced seed is preferable to using seed obtained from other areas. There are two reasons for this: the first is that locally sourced seed material is adapted to local conditions and will therefore normally perform better in the local environment. The second reason is that when a plant that has been grown from imported seed that is of the same species as local plants matures it will put its genes into the local plant population. This may disadvantage the genetic structure of the local population.



Seed Propagation Material: If collecting your own seed make sure it is ripe first. Only collect from healthy plants. If you are collecting from anywhere other than your own property, you require a licence from DBCA. If you are collecting from a friend's property and only growing plants for your own use you may do so without a license but with their permission. Do not damage the plant or the environment from where you are collecting. Collect no more than 20% material from any one plant. Collect from a population of at least 12 individuals where possible.

Cutting Propagation Material: Sourcing cuttings for clonal propagation involves carrying out the activity at the beginning of the day ideally when dew is still on the leaves and the sun is not yet warm (eg. prior to 9am). Materials selected must be free of pests and diseases and in a good actively growing condition. It must be immediately put into a plastic bag with water and kept in the shade. If being stored for any length of time it should be put in the dark and chilled – an esky is ideal. The sooner the material is made into cuttings and set out where it is to grow on the more success you will achieve.

PROPAGATING FROM SEED

Seed comes in all shapes and sizes and thought needs to be put into how it is to be placed in containers to maximise germination. Larger seeds can be covered by 3x their width, smaller seeds that are dust-like in appearance should be surface sown and kept moist until germination has occurred.



Seed can be sown in flat trays as a mass lot with individuals being pricked out and put into individual containers to grow usually after a period of 6-12 weeks. Generally larger seed is sown into individual containers and can then be left to thin in 6-8 weeks. Both of these methods are inter-changeable and particular to certain species.

Container choice is determined by the seed's germination needs. Some plants produce a very long root, and this needs to remain undisturbed. They will require a deeper container. Cell trays are ideal for producing a plant that can be installed into the environment with a planting tool (potti-putki).

Seed dormancy is an adaptation that allows a species to germinate its seed at the optimum time for its success and survival. It is a major factor in the success of germinating native plant seed that the conditions of this dormancy are understood and overcome. Some of the methods employed include hot water treatment for peas and wattles – this can involve putting the seed in a cup and pouring on boiling water. Once it is cooled, the seed can be sown. Larger seeds may require a longer period of time exposed to heat and can be boiled for 1-2 minutes. Other methods and considerations for breaking the seed dormancy can involve sowing the seed at the right time of year, using chemicals or smoked water to overcome dormancy. The one thing that is of most importance is providing moisture to the seed and maintaining this until germinated.



PROPAGATING FROM CUTTINGS

Propagation from cuttings involves inducing a piece of plant material to form roots in an artificial environment. This is an extreme action and requires special facilities to be successful. Some plant species are easier to strike from cuttings than others. Most commercial nursery obtained plants are produced by this method and are quite easy to grow. Native plants sourced from wild populations will have variable success no matter how well they are treated! Plants that are from a coastal environment have evolved to tolerate accumulation of sand around their stems and are generally easier to induce to form adventitious roots than species from the forest.

Selection of cutting material that is healthy and vigorous in growth will improve success. While all areas of a plant stem can produce new plants, the quickest and easiest is usually tip-cuttings. The base of the cutting is cut just below a node. The time it takes a cutting to produce roots is usually 6 weeks to 6 months. Special conditions for rooting cuttings are a need for an open, free-draining, sterile media, free of fertilisers; watering at regular intervals to maintain wet plants and media. Shelter from direct sunlight either through shade-cloth or shading by other means. Constant observation is required to ensure dead plant material is removed before fungal diseases take over.

Cuttings can be inserted at different depths but must have access to both air and water at all times. Trialling different methods is recommended to determine what works best for your own growing situation.



A rooting hormone applied to the base of the cut material makes the plant form roots more readily in most cases. Cuttings are moved into final growing containers once they have formed roots. This container has fertiliser added to the growing media, which can be normal potting mix.

OTHER METHODS

Plant rescue is an easy way to source plant material for your revegetation projects. It involves salvaging seedlings at a very young stage from areas where they would otherwise be destroyed. If this is to be done for commercial purposes, or from areas that you do not own, a licence and relevant permissions are required. Treatment involves freeing the roots of all soil, treat them similar to cuttings into a plastic bag with water, and make sure they are thoroughly washed, treated with 1% bleach solution for 1 minute, then rinsed, prior to tubing up in the nursery. Success with this method is dependent upon timing, ideally winter, with plants that are less than 5cm height. Firebreaks are an ideal place to obtain these materials.

Plant division is possible for some native species particularly those that are clumping plants or that produce roots from their stems along the ground. If whole plant material is being removed, it will need a special adjunct on your plant licence and to be in an area where it otherwise would be destroyed. Full sterilisation of all materials is required as for plant rescues.



MAINTENANCE OF PROPAGATED MATERIAL

All material needs to be maintained with adequate moisture to keep it growing in good condition. Plant nutrients need to be available according to plant needs. Plants need to be monitored regularly to ensure diseases are identified early and control can be put in place. Isolate diseased material so that infection does not spread, sometimes chemical controls are required, at other times cultural controls may suffice (eg. moving affected plants to an area of greater air flow and less moisture).

The best way to deal with disease is to avoid it in the first place. Sterile growing media, containers and facilities are the main requirements. Also restricting introduction of diseases through using footbaths (1% bleach solution) and hand-dips (5mL tea-tree oil 15% solution/L water) reduces the chance of infection.

WHEN TO DO YOUR PROPAGATION

It takes anywhere from 2 months to 2 years to produce a plant which can then be planted into the wild. The best time to do the planting is in winter when rains are falling, so time your propagation to have your plants ready for when winter arrives. The 3-month period of winter is usually enough for plants to become established and become self-supportive from then on. This is the advantage of using local native species. Winter is also a good time to start many seeds as you can simply sow the seed into a tray, set it outside in a shady place and by the time spring arrives you will already have a bunch of plants ready to move into their final containers and grow on for next year's planting. There are some cuttings that strike easier in warmer months, and some in colder months. You need to experiment and find out what works best for you and your facility.

You will gain knowledge over time as to when you have your successes and failures and you can adapt your methods according to this. Information is readily and usually freely available from local experts, from literature, and online. A technique that works for a genus from another area is a good point to explore using local native species of the same genus. And the journey leads onward from there. Good luck!



REFERENCES:

Alcoa Australia (1991). *How to Germinate Native Tree and Shrub Seed Enjoyably*. Alcoa Landcare Project, Commonwealth Government.

Elliott, W. Rodger & Jones, David, L. (1980). *Encyclopaedia of Australian Plants Suitable for Cultivation (Volume 1)*. Lothian Books, Port Melbourne Victoria.

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