PROPAGATION OF SELECTED UNDERSTOREY SPECIES

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CORANGAMITE CATCHMENT MANAGEMENT AUTHORITY

Natural Heritage Trust

Victoria
The Place To Be

Propagation of Selected Understorey Species

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SUMMARY

This project trialed new techniques to reproduce understorey species by both sexual propagation, (ie seedling propagation), and by asexual propagation, (ie cutting techniques). This project has been successful in propagating fifteen species, with some species being successful from both seed and cutting propagation, sixteen other species were trialed but have not yet been successfully propagated. A number of species were highly successful, others have the potential of being very successful with a minimal amount of further research and others still require extensive research.

The successful species propagation information has been published in a Department of Primary Industries (DPI) Landcare note for distribution to local nurseries. The project succeeded in its aim to produce plants in containers to be used by Landcare projects.

This project also identified the greater input of time and resources required to propagate difficult to grow species, some species will require more research before they are available in commercial quantities.

To improve plant species diversity utilised in land rehabilitation projects research into difficult to grow species must continue. Innovation within the nursery industry is essential to the enhancement of land rehabilitation works. The continuation of trials such as this one together with a flexible grant system (to encourage nurseries to continue their own research) will ensure the further improvement of species diversity in Landcare projects.

TABLE OF CONTENTS

INTRODUCTION

The Corangamite Draft Native Vegetation Plan encourages landholders and landcare groups to plant a greater number of understorey species to provide greater biodiversity benefits to all revegetation planting's. Nursery industries have traditionally grown large volumes of species that are easily reproduced. This project was undertaken in order to trial the propagation of understorey species which are difficult to grow due to lack of knowledge or research, and to gather information on difficult to grow species from growers who have been trialing techniques for many years.

AIM

The aim of this project was:

- to attempt to grow twenty-five difficult to grow understorey species by cuttings, seedlings or a combination of these methods.
- to grow on plants in a cost effective method which can be used by Landcare projects.
- to gather information from local growers and other sources on difficult to grow species.
- to provide information in an information sheet

This project will trial techniques to reproduce understorey species by sexual propagation, ie seedling propagation, and by asexual propagation, ie using cutting techniques. Using cuttings may overcome the cycles of heavy and low seed production of plants. This initial project is for 12 months and will focus on forest understorey species with a further 3-5 years of the project (dependant on funding) to investigate grassland and wetland species.

METHODOLOGY

Initially twenty-five species were identified that are currently not grown by nurseries due to a lack of knowledge. The species selected were understorey plants from forest vegetation types, and were selected as these species are currently being sought by landcare groups locally and were easily accessible to the propagation facility. Table 1 identifies the species that were chosen and the method of propagation, ie cuttings, seedlings or both.

Table 1: Species and method of propagation that was to be trialed

Species	Cuttings	Seed
Sea Box - *Alyxia sp.*		*
Silver Banksia - *Banksia marginata (Basalt Plains as only 6 remaining) **	*	
Sweet Bursaria - *Bursaria spinosa*	*	*
Australian Clematis - *Clematis aristata*	*	*
Prickly Currant Bush - *Coprosma quadrifida*	*	*
Flax Lily – *Dianella sp*		*
Common Heath - *Epacris impressa*	*	
Cherry Ballart - *Exocarpus cupressiformis*		*
Saw Sedge- *Gahnia sp.*		*
Hemp Bush - *Gynatrix pulchella*	*	*
Bushy Needlewood - *Hakea sericea*		*
Austral Mulberry - *Hedercarya angustifolia*	*	*
Coast Beard Heath - *Leucopogan parviflorus*		*
Privet Mock Olive - *Notelea ligustrina*	*	*
Satin Box - *Phebalium squameum*	*	*
Banyalla - *Pittosporum bicolor*	*	
Hazel Pomaderris - *Pomaderris aspera*	*	*
Victorian Christmas Bush - *Prostranthera lasianthos*	*	*
Balm Mint Bush – *Prostranthera mellisifolia*	*	*
Prickly Bush Pea - *Pultenea juniperina*	*	*
Twiggy Daisy Bush - *Olearia ramulosa*	*	*
Musk Daisy Bush - *Olearia argophylla*	*	*
Snowy Daisy Bush - *Olearia lirata*	*	*
Mountain Pepper - *Tasmannia lanceolata*	*	
Pink Bells - *Tetratheca sp.*	*	

Details on the methodology for seed and cutting propagation are outlined below. Additional species were also collected and trialed as they were growing in conjunction with other species collected. Additional species trialed are shown in table 2:

Table 2: Additional species trialed

Species	Cuttings	Seed
Bossia sp- Native Pea (unsure which species due to lack of flowers for identification)	*	
Bedfordia aborescens - Blanket leaf	*	
Nothofagus cunninghamiana- Myrtle Beech	*	*
Lomatia fraseri – Tree Lomatia	*	
Personia sp- Geebung	*	
Pimelia axiflora – Bootlace bush	*	

Assistance was given by the Work for the Dole crew and Apollo Bay GreenCorp team in collecting and setting the large numbers of cuttings for this project (Figure 1). An instruction sheet was written up (appendix 1) to ensure a consistent methodology was used. Also recording sheets, such as in appendix 2, were used to record where material came from, who processed the material and developments of roots over time. Sheets recording air and soil temperatures were also useful in monitoring the environment in the propagation facility.

Propagation of Seedlings

A literature search and verbal instruction was sought to identify seed pre- treatment techniques for the selected species. Seed was collected, treated and sown in trays, approximately 50 seeds were sown per species (depending on seed availability). The trays were placed in either a hot house or shed propagation facility ,being watered as required. The seed was then left to germinate, once germinated the seedlings were pricked out into Lannen trays of 64 plugs, which are used by the landcare movement.

Propagation of Cuttings

Advice from consultants was sought on the type of propagation facility that was required for cuttings to ensure the success of the project. A shed was recommended as the newest technology currently being used in the horticulture industry for cutting propagation. The reason being the change in temperature between day and night being less varied than a hot house. A shed propagation facility was used which contained heat beds for cutting propagation and a leaf arm automatic watering system. The heat beds are used to stimulate root development in cuttings.

Cuttings were taken from the upper tips of young plants (as the strike rate is higher for younger material). Cuttings were taken in the morning and placed in plastic bags with moisture for delivery to the growing facility. At the growing facility the cuttings were cut to size (approximately 7cm) dipped in hormone rooting gel and placed in trays of 200. The Australian National Botanic Gardens has found that IBA is the most effective auxin for the clonal propagation of a wide range of native species (Carmen 1993), on this basis, 'Progel' IBA (3g/L indole-3-butyric acid) was used in this trial.

The propagation media used was 'Propine' which includes perlite, Canadian peat mix and polystyrene.

Approximately 400 cuttings per species were taken and set on the heat beds (Figures 2 &3). Monitoring and maintenance was undertaken regularly to observe conditions such as over or under watering and occurrence of fungal pathogens.

Figure 1
Apollo Bay Greencorp Team with cutting material.

Figure 2 Andrew McLennan preparing cutting material.

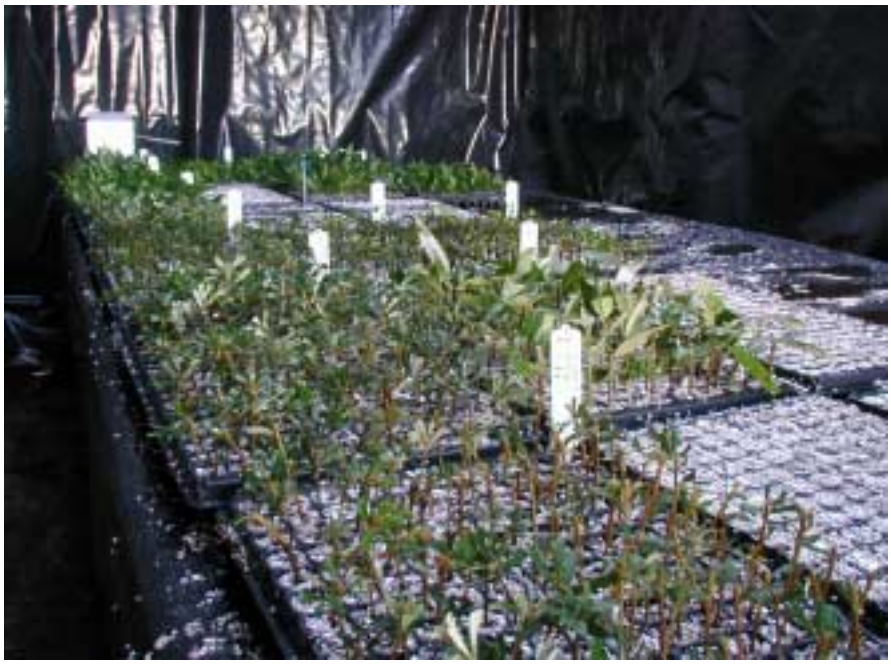

Figure 3
Cuttings in propagation facility

RESULTS

Detailed information of the trial results for each species are listed below. Detailed information of success, failure and/or possible techniques for future trials are also outlined.

The agreement to undertake this project was not finalised until March therefore the propagation facility was not ready to take plants until April. In hindsight due to the weather conditions last year the optimum time to take cuttings was in March, therefore results for some species may have been better than indicated if collected at the correct time.

A limiting factor of the propagation facility for some species was the lack of light, when moved to a hothouse some species quickly produced roots. Despite this the facility was ideal for the wet understorey forest species such as Myrtle Beech to grow. Also fungus problems were apparent at one point and the fungus was detected too late for a spraying regime to be successful.

Ongrowing of plants was undertaken when it was certain that further cuttings were not going to take or when seedlings had grown to the two leaf (cotyledon) stage. Cuttings and seedlings were pricked out into lannen containers and the plants placed in the hot house to grow on. A few losses ie 5% were experienced after pricking out occurred but this is expected.

Results of species trialed

Alyxia sp.- Sea Box *Seed*

The flesh was removed and seed treated with pure caustic soda until the seed coat was thin enough to pop the seed out of the coat with fingers. Seed was then sowed (ie December) and low germination was observed in winter (M.Prascevic pers.comm.).

Bursaria spinosa - Sweet Bursaria *Seed and cuttings*

Literature Review Information For Sweet Bursaria - Bursaria spinosa

A literature search revealed a student P Kristiansen who had conducted a graduate diploma on the use and propagation of *Bursaria spinos*a Sweet Bursaria. The literature review from the graduate diploma revealed that two reports were found on trials undertaken for the cutting propagation of *Bursari*a, both unpublished.

Personal communication with Smith and Youman identified that in a single experiment, undertaken more than a decade ago, cuttings obtained in late January were treated with a commercial rooting powder containing medium strength IBA and planted into a potting medium consisting of polystyrene foam/peat moss (1:1). A 50% success rate was achieved, and the cuttings were planted out in the following September (Smith personal communication).

In a different series of trials, a local horticulturalist achieved no more than 30% survival rate for *Bursaria* cuttings. The wounded semihardwood shoot cuttings were treated with either a commercial rooting powder ("Kendon", IBA 3g/kg) or with "Rootex" rooting liquid (concentration unknown), and planted into a sand/peat (1:1) medium in trays. The trays were placed in a polyhouse with no bottom heat or misting, but daily watering. The formation of callus or roots was not observed until after at least eight weeks. The survival rate was greater for the liquid hormone preparation than the powdered form (Youman personal communication). It was also noted by Youman (personal communication) that the time between cutting preparation and hormone application should be no more than 15 seconds, thereby ensuring the cut on the stem base is fresh.

The research project undertaken by P.Kristiansen investigated the propagation of *Bursaria* from cuttings and tissue culture. Stem cutting trials assessed a range of factors (eg. auxins, wood type) which affect rooting. It was found that using physiologically juvenile plant material such as coppice shoots was very important, and that hormone or auxin applications were of little or no benefit to rooting. Average strike rates of coppice shoot material with no hormone application were approximately 70%.

Our trials revealed that cuttings were not successful but the material used was not regrowth material. Bursaria seed that is sown fresh will germinate in the winter months, losses with this species occur with pricking out and therefore it is recommended that direct sowing is used (J.Leary pers.comm.).

Banksia marginata (Basalt Plains as only 6 remaining) Cuttings

The cuttings were not successful which may be due to the physiological age of the plants. Further attempts to reproduce these plants would be to use cutting material from seedlings, which were propagated from the six remaining basalt plains banksias a few years ago. Firm young growth is reccommended for cutting propagation (Earl et al 2001)

Clematis aristata - Australian Clematis Seed and cuttings

Propagation from seed did occur but the germination rate was very low, this may be due to the viability of the seed varying from year to year (Robinson-Koss 2002). Cuttings were not attempted due to the lack of suitable material, material is best obtained in March. A number of references indicated that propagation can be carried out from fresh seed and from cuttings (The Society for Growing Australian Plants web site, Earl et al 2001).

Coprosma quadrifida - Prickly Currant Bush Seed and cuttings

We were successful with seed sown from this species, the seed must be sown fresh but it will not germinate until winter therefore this species is a eighteen month to two year crop from germination to saleable item. Cuttings of this species have remained green and healthy with new leaves growing and/or some callus forming on all of the cuttings but only ten developed roots. This may be due to the species requiring high levels of light which was limited in the shed, references indicate this species grows readily from cuttings (Earl,G et al 2001).

Dianella tasmanica – Black Anther Flax Lily Seed

The seed was washed with water to remove the fleshy outer layer and seed sown, germination did occur but was very low. References recommend that seeds are soaked in sugary solution for 3-4 weeks. Squash fresh seed and rub through a sieve with running water to remove flesh. Much easier to remove flesh when seed is fresh, as the skin becomes quite tough as it dries like a raisin. Sow fresh seed on top of potting mix and press in. Autumn-winter germinant. (Robinson Koss, M 2002, Earl,G et al 2001).

Epacris impressa - Common Heath Cuttings

Two lots of cuttings were taken of *Epacris impressa* at different times (ie April and July) as soft tip to semi hardwood cuttings are required for this species. Cuttings of this species were not successful during this trial but references indicate that firm current season's growth will successfully produce roots (personnel communication, The Society for Growing Australian plants web site, Earl, G et al 2001).

Exocarpus cupressiformis - Cherry Ballart Seed

Seed was difficult to obtain of this species last year and therefore only a small number were trialed without success. Observations indicate that greater amounts of seed will be available in 2003 and it is recommended that further research of this species it undertaken. The literature review identified that this species is difficult to grow from either seed or cuttings. Untreated seed may take 6-18 months to germinate, seed passed through the gut of a hen and sown with host plants such as native grasses has been successful in germinating. Also root suckers are able to be successfully transplanted (Earl, G et al 2001).

Gahnia sp. - Saw Sedge Seed

Seed of this species was sown with no germinants recorded. An after ripening period is required for seed of this species therefore perhaps germinants may still occur in the future (Robinson-Koss 2002). Seed is known to germinate sporadically (Earl,G et al 2001).

Gynatrix pulchella - Hemp Bush Seed and cuttings

Seed was sown with the outer coat still attached. Germination was successful but sporadic, upon further investigation it was identified that the germination success would have been improved if the outer covering was removed prior to sowing. (Robinson-Koss 2002). A second batch of seed was treated with smoke treatment prior to sowing and germination was greatly improved. Cuttings were attempted but with little success, again improvement of success is expected with current seasons growth as Earl, G et al; (2002) indicate it grows readily from cuttings.

Hakea sericea - Bushy Needlewood Seed

Hakea sericia seed germinated easily without any treatment of the seed, literature indicated that sowing seed in late winter was recommended for good success. (Propagation for selected native plants website).

Hedycarya angustifolia* - Austral Mulberry *Seed and cuttings

Seed and cuttings were successful for this species. The cutting success rate was low and further research is required to improve success before nurseries will undertake this method of propagation. The seed that was collected just before it would drop off the trees. Ripe seed was washed to remove the pulp and sown. The germination rate was high but did not germinate until winter. Best results were found with seed sown in a shade house (J.Leary pers.comm.)

Leucopogon parviflorus - Coast Bearded Heath Seed

Seed was collected and treated with a 50% caustic soda solution for 2 weeks, the seed was then put in a 5% casutic soda and vermiculate slurry until the seed coat was thin enough to pop the seed out in your fingers. The ideas behind this were to try and recreate a birds stomach which is how this species germinates in the wild (M.Prascevic pers.comm.)

Notelea ligustrina - Privet Mock Olive *Seed and cuttings*

Seed was collected flesh removed by washing and seed sown. The seed did not germinate until winter, success of germination was sporadic and slow to obtain the first leaves (cotyledons). This species had a very high success rate ie 90% of root formation from cuttings using hormone gel and heat beds (Figure 4). Definite possibility for production from cuttings if seed unavailable.

Figure 4: Privet Mock Olive - *Notelea ligustrina* cuttings with root development

Olearia argophylla - Musk Daisy Bush Seed and cuttings

This species is readily grown from fresh seed sown from autumn to spring and covered lightly. Semi hardwood cuttings had a low level of success ie 10% but further research with soft tip cuttings may improve these figures.

Olearia lirata - Snowy Daisy Bush Seed and cuttings

Seeds of *Olearia lirata* were sown in autumn with mutiple seeds per cell at a depth of 3-4mm. The germination success was 45-50%. Smoke treatment improves germination (Earl, G et al 2001). Semi hardwood cuttings had a low level of success ie 5% but further research with soft tip cuttings may improve these figures.

Olearia ramulosa - Twiggy Daisly Bush- Seed and cuttings

Seeds of *Olearia ramulosa* were sown in autumn with mutiple seeds per cell at a depth of 3-4mm. The germination success was 30%. Semi hardwood cuttings had a low level of success ie 5% but further research with soft tip cuttings may improve these figures.

Phebalium squameum - Satin Box ***Seed and cuttings***

The Satin Box had produced callus within two and a half months of cuttings being set, but no further success was seen. No success with germination of seed, smoke treatment may be worth trialing in the future.

Pittosporum bicolor - Banyalla ***Cuttings***

We had no success with growing cuttings, note that the material that was used was not ideal. References indicate that growing this species from cuttings is possible (Earl, G et al 2001).

Pomaderris aspera - Hazel Pomaderris ***Seed and cuttings***

From seed which may require scarification, or cuttings of firm young growth. Pour boiling water over seeds and soak before sowing, or apply dry heat at 150 C for 10 minutes. (South West Slopes Revegetation Guide). In our trials Hazel Pomaderris seed was sown in autumn and began germinating in the winter months. Cuttings of a small number were successful further attempts with young firm growth may have greater success.

Prostranthera lasianthos* - Victorian Christmas Bush *Seed and cuttings

Victorian Christmas bush seed was sown in June and began germinating in December with good results. Robinson-Koss (2002) indicates it is a Autumn-winter germinator but low seed viability can be a problem. Cuttings were set in April and a low number produced roots within two months. Soft tip cuttings taken with a heel at the ideal time will improve the success of this species and also mist is known to rot cuttings of this species (Earl, G et al 2001).

Prostranthera mellisifolia* - Balm Mint Bush *Seed and Cuttings

The chaff and seed was burnt and then sowed in autumn. The seed began to germinate in July, which indicates that this species germinates over winter. Cuttings of this species have remained green and healthy for over 2 months with 10% of the cuttings growing roots within the first 3 weeks, the remaining material has not callused or produced roots but remains healthy. The material to successfully grow roots within three weeks was softwood material.

Pultenea juniperina - Prickly Bush Pea ***Seed and Cuttings***

Seed was collected and sown fresh the pretreatment used was boiling with no success of germination. '*Propagation Methods Of Selected Otway Region Understorey Plant Species'* Mike Robinson Koss (2002) states that fabaceae species should be treated with hot water before sowing and that the seed readily germinates but seedlings suffer from nitrogen deficiency until rhizobial bacteria forms on seedling roots. So seed needs to be sown in spring to give bacteria enough summer warmth to develop. Growers may speed up the process by collecting nodules from parent plants and adding to potting mix through various means. Spring-summer germinant.

Semi hardwood cutting were taken, the cuttings remained green for 2 -3 months but did not produce callus or roots before drying up.

Tasmannia lanceolata - Mountain Pepper ***Cuttings***

Soft tip cuttings successfully grew roots on a low proportion of cuttings ie 15%. Once moved into a hothouse further root formation occurred indicating that the propagation facility did not have enough light for this species to produce roots from cuttings.

Tetratheca ciliata - Pink Bells ***Cuttings***

Propagation can be carried out from seed but this is rarely available. Cuttings of hardened, current season's growth usually strike fairly readily. (Society for growing australian plants web site). A low success rate ie10%, of cutting propagation was experienced with this species, further research is required on type of material to use ie semi hardwood ect.

Additional Species

***Bossia sp*- Native Pea (unsure which species due to lack of flowers for identification) Cuttings**

Cuttings where not successful but the cuttings remained green for three months before drying off.

***Bedfordia aborescens* - Blanket leaf Cuttings**

Cuttings of Blanket leaf were set but deteriorated very quickly due to the soft nature of the material.

***Nothofagus cunninghamiana*- Myrtle Beech Seed and cuttings**

Seed was sown with no pre-treatment in two trays in August. One tray placed near the door did not germinate (perhaps due to drier conditions), the second tray (at the opposite end of the house with no door) germinated within 2 weeks. Again an Autumn-winter germinator. Semi hardwood cuttings taken in June on a heat bed successfully produced roots in 3 months (Figure 5).

Figure 5: *Nothofagus cunninghamiana* cuttings with root development

***Lomatia fraseri* - Tree Lomatia Cuttings**

Cuttings of this species were set with no success of rooting.

***Pimelia axiflora* - Bootlace bush Cuttings**

Approximately 4500 cuttings of this species have been trialed in a number of different environments ie hothouse, shade house, on hotbeds with progel, rootex liquid, rootex powder; but there have been no successes.

***Persoonia sp*. – Geebung Cuttings**

Cuttings where not successful but the cuttings remained green for three months before drying off, which is in line with Earl,G et al (2001) that states cuttings from very young growth callus readily but do not readily root.

DISCUSSION

This project has been successful in propagating fifteen species out of the thirty-one trialed, with some species successful from both seed and cuttings. A few species were highly successful such as Privet Mock Olive (*Notelea ligustrina*) cuttings, Hemp Bush (*Gynatrix pulchella*) seed, Bushy Needlewood (*Hakea sericia*) seed, Austral Mulberry (*Hedycarya angustifolia*) seed, Balm Mint Bush (*Prostranthera mellisifolia*) cuttings and seed, Mountain Pepper (*Tasmannia lanceolata*) cuttings, Myrtle Beech (*Nothofagus cunninghamiana*) seed and cuttings, Sweet Bursaria (*Bursaria spinosa*) seed and the Daisy bushes (*Olearia sp*) from seed. Others such as Prickly Currant Bush (*Coprosma quadrifida*) cuttings, Austral Mulberry (*Hedycarya angustifolia*) cuttings, Victorian Christmas Bush (*Prostanthera lasianthos*) cuttings and Daisy Bush (*Olearia sp*) cuttings have the potential of being very successful now that we know the techniques to employ to improve success. Then there are other species that we still need to do further work on. An information sheet has been written with a summary of propagation information for the successful species from this project (Appendix 3).

Growing plants from seed has always been the most economical method of plant production and our aim should be to grow most plants from seed. Cuttings can be used to reproduce plants where few remain in an area, or for species such as Privet Mock Olive (*Notelea ligustrina*) which has sporadic seeding. Care must be taken with cutting propagation to ensure genetic diversity is maintained. Cuttings should be taken from a number of plants in an area and from appropriate provenance areas as is the desired practise with seed collection. Time frames for successfully growing some species from cuttings can be a eighteen-month to two year crop, this brings with it increased production costs for nurseries to provide these plants.

This project has identified that there are a number of species that are difficult to grow and require more research into propagating techniques. It is these species that nurseries will not produce in commercial quantities for many years. The cost of difficult to grow species needs to reflect the large amount of time and effort required in researching and growing these plants. In order to improve our species diversity in Landcare projects grants need to be flexible enough to accommodate for difficult to grow species such as providing a sliding scale for plant costs. For example list A, B and C with A being easy to grow plants and C difficult to grow plants and a pricing structure ranging from 80c to $2.00. This model will encourage nurseries to continue trialing propagation techniques of difficult species on their own.

Local nursery persons have willingly shared their knowledge and information on the propagation methods for the twenty–five 25 species selected in this project. Given the right forum local nursery persons would be willing to provide further information about other difficult to grow species. The continuation of this project would enable another selection of difficult to grow species to be trialed. The opportunity is available now to utilise the propagation facility that was set up for further projects.

Ongrowing of plants into lannen trays was successful with a low mortality rate due to transplantation. This ascertains that the methods used to propagate seed and cuttings in trays and cell trays is an acceptable method for propagating of understorey species to be used by Landcare projects.

CONCLUSION

In summary this project has been successful in propagating fifteen species out of thirty-one trialed, with some species successful from both seed and cuttings. A number of species were highly successful, others have the potential of being very successful and others still require further research. A Landcare note with a summary of propagation information for the successful species from this project is available (Appendix 3).

Growing plants from seed has always been the most economical method of plant production and our aim is to be able to grow all plants from seed but cuttings do have their place. Ongrowing of plants into containers that can be used by Landcare projects was successful.

Time frames for successfully growing some species from seed or cuttings can be up to two years, this brings with it increased production costs for nurseries. To improve our species diversity in Landcare projects and encourage nurseries to continue trialing propagation techniques of difficult species on their own a sliding scale of plant costs is recommended for grants.

Local nursery persons have been very keen in sharing their knowledge and information and the opportunity is available to continue this project to trial further difficult to grow species.

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Appendix 1 CUTTING SHED INSTRUCTIONS

Tray sterilization

- Trays need to be sterilised in a 1:100 solution of water and biogram (100ml of biogram to 10L of water). Trays are just dipped into the solution and then into clean water and drip dried.

- Fill trays with potting mix.

- Water trays well till drippingout the bottom of the trays.

Cuttings

- Prior to taking cuttings from material you need to dip all material in a 0.5% solution of sodium hypochlorite (5ml white king and 1L of water.) and then rinse in water.

- Sterilise cutting implements with methylated spirits prior to use and wash hands prior to taking cuttings. (If smoking wash hands before handling cutting material as nicotine can affect the successfulness of roots on cuttings).

- Cut material into approximately 7cm long, remove lower leaves. Two small leaves or half of two larger should be left on the top of the cutting.

- Dip cutting into hormone gel and place into potting mix tray. Push potting mix around the stem of the cutting.

- Once tray is full label and place on hot bed. (Label with name of species, date and lot number ie 12, 13 ect)

- Sheets need to be filled out for each species that is brought into the shed. A blue folder holds all the sheets, please fill out prior to leaving shed.

Prior to leaving shed please clean up any left over material, plant waste to be placed in plantation behind shed. Please sweep the floor. Ensure watering system is on and working. Lock the door behind you.

Appendix 2 RECORD SHEETS

CUTTING PROPAGATION UNIT – NOTES AND INFORMATION

WORK CARD LOT NO._____

Botanical Name:_____

Common Name:_____

Date Collected: / / 2002

Site:_____

Collector:_____

Date Sown: / / 2002

Treatment: Grow- gel Bleach

Other : _____

Approximate Rooting Date: / / 2002

Potting Up Date: / / 2002

Extra Information (including description of cutting material)

_____

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