

Propagation of *Chamelaucium uncinatum* Cultivars by Grafting[®]

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INTRODUCTION

Geraldton waxflower is one of the most spectacular wildflowers of Western Australia. Flowering occurs during the early spring wildflower season. The native flower and nursery industries have selected a range of superior colours and forms, and these have been introduced to the flower and nursery industries across Australia. The mass flowering effect creates a large, spontaneous demand from the flower- and plant-buying public.

The University of Queensland Plant Nursery Unit has propagation licences in place with the breeders in Western Australia, and these licences enable us to supply plants to flower growers and nurseries across Australia.

WHY GRAFT GERALDTON WAXFLOWER?

The native soil profile of Western Australia is a very deep, sandy soil with free-draining properties. The soils of south Queensland are predominantly heavy clay with relatively poor drainage. The high summer humidity and rainfall in south Queensland contribute to the soil-borne fungal problems frequently experienced here. *Phytophthora cinnamomi* is the major killer of Geraldton waxflower. The University of Queensland has assessed the disease resistance of a number of selected forms of waxflower as rootstocks, and a selection code named B4C4 is the rootstock principally used for grafting the phytophthora-sensitive selection on to.

PRODUCTION OF THE ROOTSTOCKS

- The cutting material for our B4C4 rootstocks is collected in July during the plant's most dormant stage of growth. The cutting material responds quickly once placed in propagation.
- The soft shoot tips are collected with sharp secateurs and placed in a Styrofoam box. The cuttings are moistened in the box, and an ice pack is placed in the box.
- The shoot tips are placed in chlorinated water for 1 min to eliminate any surface pathogen problems.
- The cuttings are prepared by selecting the tips that are semi-hardened and cut to 8 cm in length; the leaves are stripped from the bottom 4 cm of the stems.
- The cuttings are dipped in a 4000 mg·L⁻¹ IBA solution for 5 sec.
- The cuttings are stuck in a propagation medium comprising: Canadian peat moss, vermiculite, and perlite (3 : 3 : 4, by volume) plus 2 g·L⁻¹ mini Osmocote.
- 100-cell plastic trays with root trainers are used for high quality root development.

- The trays of cuttings are placed on open weldmesh benches in our fog propagation house.
- The propagation house has warm-water basal heating of 25 °C; 90%–95% humidity is maintained by the fogging system.
- The cutting trays are hand-watered as required.
- A strict fungicidal spray program is carried out weekly with a rotation of five different fungicides applied as a preventative spray.
- After 8 weeks an average 90% strike rate can be expected. The struck cuttings are then tubed into 50 × 50 × 100-mm native tubes.
- The native tubes have internal root trainers for optimum root quality.
- The trays of tubed rootstocks are placed on benches in a growing-on greenhouse with 30% shading on open weldmesh benches to be grown on for a further 8 weeks. They are hand-watered every day. The tubestock continues to be given the same fungicide spray program as the cuttings under propagation.
- This brings us to September, and the rootstocks are ready for grafting. The stem of the rootstocks should be 2 mm or more in diameter.

THE GRAFTING PROCESS

- The scion material should be collected fresh on the day chosen for grafting.
- The scion material should be healthy and in a semi-hardened condition.
- One grafter can achieve an output of 250 grafted plants in a 7-h working day comfortably.
- Once the scion material has been dipped in a chlorine solution for 1 min, the moist material should be placed in a Styrofoam box with an ice pack until used.
- A sharp grafting knife, Parafilm™ tape, a water spray bottle, and small cutters are required for grafting.
- Parafilm is the preferred tape used because of its stretching qualities as it binds on itself, eliminating the need for knots.
- All of our grafting work is carried out in an air-conditioned room to eliminate wilting of the scion material and for operator comfort.
- Selecting a strong, straight-stemmed rootstock ensures that a strong graft union will develop.
- The top of the rootstock is removed approximately 12 cm up the stem to eliminate the apical dominance of the rootstock. This will ensure that the growth of the scion shoot is promoted.
- A side splice graft is used to fasten the scion to the side of the rootstock stem.
- A 3-cm slice of bark is removed vertically from the stem of the rootstock, exposing the cambium layer. The rootstock is now ready for the scion to be attached.

- A healthy shoot tip of the scion material is selected, and a corresponding cut is made in the basal side of the stem to expose the cambium layer. The tip of the scion shoot is removed to overcome apical dominance and the basal portion of the stem has the leaves removed.
- The scion material is positioned on the side of the rootstock, and the Parafilm tape is used to bind the two together, ensuring that no moisture can penetrate into the graft union.
- During the grafting process the grafted rootstocks are kept moist with the spray bottle. When a tray of grafted plants is full it is placed in the same fog propagation house in which the cuttings were rooted. Hand-watering is done as needed.
- A period of 2 weeks is needed for the graft union to form, and then the top of the rootstock can be removed to stimulate scion shoot growth.
- After cutting back of the rootstocks, the grafted plants are held under fog for a further 2 weeks. They can then be moved into another greenhouse with a lower humidity and higher light level to grow on.
- By November there should be vigorous growth of the scion shoots, and the scion shoots are tip pruned to promote a bushy habit. Any regrowth shoots from the base of the rootstocks should be removed.
- Eight weeks of growing on in the greenhouse will bring the grafted tubestock to a saleable size. The grafted plants are then moved outside into full sun for at least 2 weeks before sale. Nursery customers are supplied with plants in February, and cut flower growers are supplied in April.