Propagation of Quandongs

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INTRODUCTION

Demographic studies illustrate quite clearly that it is not until the fifth generation after initial migration that people become fully integrated into a new environment. European settlement in Australia is in its fifth generation and it is only now that we are looking to commercialise our own fauna and flora. Part of this process is the development of an Australian cuisine. We are labelling it "Bush Tucker". With the guidance of aboriginal people and early settler records we are searching our native flora for new tastes and garnishing possibilities.

The quandong or native peach, *Santalum acuminatum*, is now being cultivated in commercial orchards to meet the demand for its highly prized fruit.

Some 20 years ago Dr. John Possingham, chief of the CSIRO Division of Horticulture, set about domesticating this delicate desert dweller. *Santalum acuminatum* has evolved as a partial root parasite of other plants for its survival. The species varies enormously in many of its characteristics such as tree vigour; fruit size, shape and colour; flesh to pit ratio; etc. In order to gather selections from the wild and monitor their characteristics in a controlled orchard situation, CSIRO first had to develop an asexual propagation technique. This was achieved by grafting selected scions to seedling rootstock. Success came through attention to hygiene procedures and by removing the seed from the extremely hard shell. To achieve the seed removal a hand operated nut cracker was developed. The two main disadvantages of this system were that a significant number of seeds were destroyed by exerting too much pressure, and that the whole process was most time consuming.

Our nursery was asked to commercialise the production of quandong trees and to this end we have been appointed the prime licensee for the production and sale of CSIRO selected quandong cultivars. We have followed the procedures as recommended by Grant and Buttrose (1978), Sedgley (1984), and in particular Dr. Brian Loveys. Dr. Loveys addressed the inaugural meeting of the Australian Quandong Industry Association (AQIA) in December of 1993. He described the following method of infiltrating the very hard shell of quandong seed with a solution of fungicide and growth regulator using a vacuum.

MATERIALS

- Surface sterilant (pre-germination treatment)—0.45% available chlorine solution;
- Fungicide and growth regulator infiltrate—Terrachlor (750 g kg^{-1} Quintozene) 1 g $litre^{-1}$ solution, Terrazol WP (350 g kg^{-1} Etridazole) 49 g $litre^{-1}$ solution, Pro Gibb (100 g $litre^{-1}$ gibberellic acid [GA]) 2 ml $litre^{-1}$ solution;
- 500 g quandong seed (approximately 200 seeds in shells);

- 500 g sterilised vermiculite (horticultural grade—steam at 100C for 30 min);
- Plastic bag.

Note: For all solutions described, preboiled rain water which has cooled to room temperature is used.

METHODS

- Weigh 500 g of quandong seed (approx. 200).
- Measure 500 ml of surface sterilant and soak seed in sterilant for 30 min.
- Rinse seed twice in pre-boiled cool rain water to remove sterilant. Seed must not dry out once moisture imbibing has commenced.
- Soak seed in pre-boiled cool rain water overnight.
- Drain seed—do not allow to dry out—soak in 500 ml of fungicide and growth regulator infiltrate and apply vacuum until bubbles cease. This indicates that the seed cavity is saturated with solution.
- Tip seed plus solution into 500 g of dry sterilised vermiculite in a plastic bag and seal with a twist tie.
- Place bag in a constant temperature of 15 to 18C.
- Observe weekly. When a seed has a radical approximately 1 cm long it should be "pricked off" into "grow tubes" approximately 50 mm × 300 mm, with a low phosphorus potting medium.
- Grow on, graft, and sell plant with a host plant well established in the grow tube.
- Transplant to orchard or garden with absolutely no root disturbance.

RESULTS

Forty thousand seeds have been sown using the technique described and although "pricking off" is not yet complete, indications are that germination will be 70% to 96%, depending upon cultivar. This result is similar to that achieved using the techniques of Grant and Buttrose (1978) and Sedgley (1984). However, the initial growth rate has been stimulated by the application of GA and the seedlings are protected against infestation by *Pythium* and *Rhizoctonia*.

CONCLUSION

Dr. Loveys' technique has not enhanced percentage germination, but has proved to be a great timesaver, particularly in the removal of the shell and subsequent seed destruction. Seed destruction during shell removal was approximately 20%. We have yet to determine the number of days from germination to graftable size but suspect this will also be improved due to the addition of GA to the infiltrate.

LITERATURE CITED

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