

The medium should be free draining and contain fertiliser at a rate similar to that used for bedding plants. The medium I have used is made up of 30% composted Fibremix (N.Z. Forest Products Ltd), 30% granulated bark, and 40% medium grade pumice. To this the following fertilisers are added per m³ of mix:

- 5 kg dolomite limestone
- 4 kg 4-month resin-coated slow-release fertiliser (14/6.1/11.6)
- 1 kg superphosphate
- 0.2 kg calcium ammonium nitrate
- 0.2 kg fritted trace elements

This has proven adequate to date but may be improved upon in the future as more experience is gained with the crop.

Just prior to sowing, the mix is drenched with Terrazole (etridiazole, Olin) to suppress damping off. A second application is applied three days after sowing. Thereafter, alternating applications of Ridomil and Benlate are applied once every 3 to 4 days until the first set of true leaves have formed. Weekly applications are then adequate up to the time of planting out. The glass is slowly lifted after the plants have developed their first set of true leaves. If the seedlings are in a glasshouse under strong light, a shade tent may be required to prevent scorching. Pricking out is performed once the second set of true leaves have formed.

LITERATURE CITED

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2. Ohteki, T 1982 *Cut flower production — Japanese techniques* Tech. Bull No 1. Ministry of Agriculture and Fisheries, N Z

PROPAGATING FEIJOA BY BENCH GRAFTING

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Feijoa, a native of South America, was introduced to New Zealand in the early 1900's. Since this time selections of plants with fruit suitable for export is an ongoing process with "improved" cultivars coming onto the market periodically.

In the late 1950's, Duncan & Davies were producing named cultivars feijoa by layering. Trials have been done since then with field grafting, bench grafting, budding, and

cutting production. While cutting production produced results varying from 40% to 60%, depending on cultivar, the most successful to date has been bench grafting. This is the method I will deal with.

The main cultivars we graft are 'Mammoth' and 'Triumph', with lesser numbers of 'Coolegei', 'Robert', 'David', and 'Variegata'. We do not grow 'Apollo' and 'Gemini', as these are restricted to six nurseries granted propagating rights.

Seed of *Feijoa sellowiana* is sown in trays progressively in winter, from July through August, then pricked out in September/October (spring) into 7cm Maclons in a 1 part pumice, 2 parts peat, medium and put into a heated house for four weeks. They are then shifted into a shade house to harden off and thereafter outside. These are grown until autumn (April), given regular foliar insecticide/fungicide sprays, fortnightly liquid feeds from December through to March, and monthly fungicide drench sprays to produce clean, healthy stocks.

In April, grafting begins and carries on to early September. The first step is preparing the understock. For this we cull any unsuitable plants, remove from the pot, and cut the bottom cm off the root system to reduce root coiling then trim clean the bottom six cm of the stem. Stocks should be 5mm to 10mm in calibre at four cm about soil level. The scions should be three-noded using only matured wood. The plant is cleft-grafted at 3 to 4 cm high on the rootstock, matching up the cambium layers on at least one side and tied with a rubber grafting tie.

The propagation houses are filled to a depth of 250 mm with an unfertilized 1 part sawdust, 2 parts fibremix medium. The grafts are plunged into this burying the graft union. Bottom heat is maintained at 25°C. around the graft to induce quicker callusing.

The mist needs to be set frequently enough to maintain moisture on the leaves but not too high to make the mix soggy as this reduces the bottom heat temperatures and increases the likelihood of fungus diseases. Grafts are sprayed weekly with Benlate and Ridomil. Humidity is initially kept high but as callusing and buds develop the crop is hardened off. In the winter months this can take up to three months but with the longer days and warmer air temperatures of spring the grafts done in late winter are ready for handling within 6 to 8 weeks.

We have been doing trials with grafts under fog instead of mist. The fog is simply a mixture of water (up to 10 litres per hour) and compressed air, kept at 80 p.s.i. This goes through a mixing chamber and out a nozzle to produce a very fine water droplet size resembling fog. As the grafts callus, the amount of

fog is reduced by increasing the time off periods and reducing the water flow. To date we have had very pleasing results, with an increase in percentage take (90% compared to 85% under mist), and less time required in the propagation house. Grafts done in mid-winter needed only 8 weeks compared with 12 weeks under mist. Grafts done in early September were virtually ready for lifting 4 weeks after grafting with developed bud initiation.

When well-callused with new growth they are lifted, untied, desuckered and potted into a PB6½, and put in a poly-tunnel house with high light levels and air temperatures to force new growth. They remain in the polyhouses for up to 12 weeks, being trimmed to a single leader and then tipped at 30 cm to branch. The polycover is removed and replaced with a 70% shade cover to harden-off the plants — then this is removed four weeks later.

The plants are sold from April onwards, ranging in size from 60cm to 80cm, with four to six branches on the top.

In conclusion, the main reasons for Duncan & Davies grafting are:

- (1) Fuller utilisation of cutting/scion wood as we get a better "take" than with cuttings.
- (2) A stronger plant is produced more quickly than by cuttings, although ultimately there is no real difference between cutting and grafted plants.

PROPAGATION OF THE N.S.W. WARATAH (*TELOPEA SPECIOSISSIMA*) BY TISSUE CULTURE

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INTRODUCTION

The genus *Telopea*, in the Proteaceae family, comprises four species all indigenous to Australia. *T. speciosissima*, the New South Wales waratah, is a woody shrub which produces large red blooms in the spring.

Its cultivation in New Zealand is increasing to meet cut flower market demands. However, its potential has been limited by the variable flower quality in plants raised from seed. A few clonal selections have been made in the past and vegetatively propagated by cuttings. Others are currently being eval-