

PROPAGATING AND PRODUCING STONE FRUIT TREES IN ONE YEAR

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Climate. To achieve this goal, a suitable climate is essential. Our operation is carried out in the central western slopes of New South Wales where we have a 7½ month growing period for stone fruit, from mid-September to the end of April (early spring to late fall). This procedure is known as “June budding” in the Northern Hemisphere.

Seed. Golden Queen peach seed is our main stock. We used to purchase these dried, direct from the cannery, and had only 50% germination. We found out that they were dried on a concrete slab in direct sunlight in temperatures of up to 40°C, up to 4 inches (100mm) deep and raked over when manpower was available. We now cart the seed home in bulk direct from the hoppers and dry on a slatted floor in a shed, resulting in 80% + germination. This seed is purchased at late summer and, after drying, is bagged. In late fall the bags of seed are immersed in water for 24 hours to swell the kernel. (Failure to do this will result in a very poor germination, the majority of seeds germinating the following year). The bags are then removed from the water, allowed to drain for 48 hours and then stratified in refrigeration at 2°C for 3 to 3½ months. Planting takes place in late winter (mid- to end of August).

Land Preparation. This is commenced in mid-autumn (April); an old lucerne (alfalfa) area is firstly sprayed with Roundup and then plowed and, with continual working, we endeavour to have the land in a small seed bed condition by late winter.

Sowing. Drills approximately 1 inch (25 mm) deep are run a metre apart and the seed is hand-dropped 50 to 75 mm apart, then covered with a hill to a depth of 75 mm. Germination starts in early spring (mid-September).

Weed Control. This starts when approximately 80 to 90% of the seed has germinated and consists of three applications, a month apart, of 1 kg of active ingredient Surflan per hectare. Trees are over-sprayed with no adverse effects and the Surflan is watered-in within 24 hours of application. This gives very good control of annual grasses, particularly Barnyard Grass, our main problem. Not starting our weed control programme until after the peach seed has germinated, (we intend doing trials this year on the effect Surflan has on peach seed germination) means that we are committed to do one hand hoeing of the area. After budding, when trees are approximately 18 inches (500 mm) high, and a lot of green has disappeared from

the bark, either Triquat or Gramoxone is used as a knock-down. Inter-row cultivation is done with tynes and rotary hoes mounted on a high-rise tractor.

Fertilisation. This is essential if we are going to produce a suitable tree in 12 months. At sowing, a ready mixed fertilizer containing 10% nitrogen, 33% phosphate, and 10% potassium is applied at the rate of 2½ kg (5 lbs) per 30 metres (100 ft) of row. This is followed 3 weeks after germination with a similar application. Following this, Nitram is applied at the same rate at 3 week intervals. With this rate of Nitram the odd tree will burn, demonstrating that maximum rates are being applied.

Irrigation. This is done by overhead sprinklers. All watering is done at night and knocker speed has been doubled as the sodium chloride salt content in the water at times goes to 120 ppm, possibly not high by a lot of standards but the danger level for plums, particularly when the bud is in the soft rosette stage, is 70 ppm; we have found that by keeping the leaves wet instead of letting them dry before the next round of the sprinkler we can minimize burn.

Budding. This is our busiest time of the year and the time when most stress is placed upon all those concerned as we have from about 20th November to the end of December (late spring to early summer), a period of six weeks, to complete same. Suitable mature budwood is not available prior to mid-November, and we are running out of growing time if we bud after the end of December. The stock trees at the time budding starts should be a minimum diameter of 5 mm, or at least average knitting needle thickness, and well watered to ensure sap flow. T-budding is the method used and if we can't push the bud straight in without physically opening the bark we move out of this block of trees, water it well, and come back in a few days time. Too much importance cannot be placed on having an adequate sap flow in the stock. The same applies to budwood. It has to come from well-watered trees, virus-tested whenever possible, and of a size to suit the stock. The reason we insist on having the budwood source well-watered is that we snap all our buds off the stick (leaving the back wood behind); too many buds are lost from dry sticks. If the sap is flowing in both the stock and the budwood, the budwood cut and trimmed before wilting, stored correctly and free from virus, one should never expect less than 90% take in stone fruit trees. Very few people realise the financial impact that virus can have on the industry. At times we have dropped to a 50% take with virus-affected budwood obtained from Research Stations, as well as private orchards; the growth was so poor on those that took that the trees were unsaleable at one year old. I feel that we should lobby whenever the opportunity

arises to have more funds made available to Agricultural Departments to extend their virus testing facilities.

Buds are tied in with rubber bands 120 mm long and 3.5 mm wide leaving the bud itself uncovered. These are a lot faster than tapes to tie and deteriorate in about three weeks saving the labour of cutting them off. Wherever possible we endeavour to bud high enough to leave some leaf growth below the bud.

Immediately after budding, 50% of the tree is cut off and 15 days later the stock is cut to just above the bud, a good proportion of which should then be pushing; any sucker growth is left until the bud is approximately 150 mm (6 inches) long. It is then completely trimmed off, and this is when the tree really starts to grow.

Pest Control. Temik, a granulate, is incorporated into the soil immediately after suckering. This translocates into the tree and gives very good control of thrips and other insects that would check or otherwise damage the young growth. Gusathion is used late in the season for tip moth control.

Digging. This commences early in June (early winter) using a U-shaped blade behind a high-rise tractor. We endeavour to dig the whole crop prior to delivery starting.

Being in an area isolated from all orchards, and able to rotate, disease control is relatively easy, but because of the fact that a lot of the trees go into old orchard situations all trees are dipped in a No-Gall solution immediately after digging.

In conclusion, if you are prepared to accept the extra worries of producing a one-year tree, (because everything has to be done when the tree is ready, not when you are ready), you can produce a tree that is very acceptable to the trade. It is dug with a minimum of root damage, and no loss of bottom buds shooting and dying because of shading; it is a tree that can be adapted to any of the training methods used in orchards today.

PLANT BIOTECHNOLOGY, SOMACLONAL VARIATION, AND VARIETAL IMPROVEMENT

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INTRODUCTION

Plant improvement and varietal selection originated with the dawn of human society. Under the pressure of deliberate