

M7 Orchard Protocol

Note: Treatment timings in this protocol relate to the Sunraysia region of Australia and may require modification for your region.

Introduction: Vigour and tree health and balanced crops

Vigour and Tree Health

The high vigour of the M7 can cause occasional bark cracking (Figures 1 and 2) which under normal circumstances heals without causing problems. Under particularly vigorous growing conditions and high humidity, such as under tree guards, these cracks can be more pronounced and the bark can turn a reddish-brown colour and occasionally can become infected by fungal or bacterial agents causing shoot dieback and bark damage. It has also been found that copper is readily depleted in the tree's system, possibly associated with this high vigour. It is therefore very important to follow the recommendations for copper sprays below.



Figure 1: Cracks which have healed on maturing wood



Figure 2: Reddish-brown colourisation of healed cracks



Figure 3: Vigorous three year old M7 tree

Using appropriate cultural practices the M7 has proven to be highly productive of excellent quality fruit.

Balanced Crops

The M7 is a very early maturing navel orange which consequently has a shorter time for fruit growth between flowering and harvest, than later varieties.

There is also a propensity for the variety to set heavy crops that can impact negatively on fruit size.

The variety is precocious and young trees can set heavy crops during a time where we seek to maximise tree growth, so it may be necessary to implement crop regulating practices earlier than would otherwise be required on young trees of other navel varieties.

To maximise profits, fruit size has to be optimised. It is necessary therefore to ensure all possible cultural practices are followed to achieve this result.

If fruit is grown on weak branches or in bunches, the fruit may finish too small and have a tendency to split. Conversely, if crops are too light, some fruit will finish course with thick skins and delayed maturity. Therefore, it is very important to achieve balanced crops grown on vigorous wood. This can be achieved by following the recommendations on pruning and winter GA sprays.

Maiden trees up to four years old should not require any special attention with only minimum pruning. Once they pass this stage, we need to maintain balanced crops with a gibberellic acid (GA) application in winter in conjunction with pruning.

Particular attention to achieve balanced crops is important with top worked trees as they can tend to set too much fruit, with some arranged in bunches.

Key Notes

The following cultural practices are important to optimising returns from the M7:-

1. Copper foliar sprays for nutrition and tree health.
2. Winter GA spray for balanced crops.
3. Pruning for balanced crops.
4. 2,4-DPP (Corasil) spray to improve fruit size.
5. Alternatively, 3,5,6 TPA (Tops) for fruit thinning and to improve fruit size.

Copper Foliar Sprays

As mentioned, the M7 is very vigorous and can quickly become deficient in micro nutrients, particularly copper, resulting in some potential bark cracking.

Regular applications of copper will reduce this incidence and will not have any commercial impact on production and quality and will maintain tree health.

Any high grade copper (e.g. copper oxide) at 25% of the label rate could be added at every foliar spray.

Copper Chelate may be more effective in this respect.

Winter GA Spray

Applications of winter GA will help in thinning flowers and reducing bunches of fruit and improving overall fruit size.

This practice should be considered starting the first or second winter after planting or top-working in order to have balanced consistent crops.

Timing: Early June (in the Sunraysia region of Australia)

Rate: 10 ppm.

A second application at 10 ppm could follow at bud break (late July in the Sunraysia region) if a very heavy bloom (light crops on the tree, vigorous foliage and cold winters) is anticipated. Experience has shown that the early application works well and any further applications should proceed with caution.

Trial these treatments to gain experience under your conditions, prior to large scale application.

Pruning

The M7 has the tendency to grow thick canopies in the lower part of the tree leaving several layers of fruit that may not be of marketable size.

It is recommended that these layers be thinned by hand pruning removing medium sized limbs. Annual pruning should always be considered to enhance fruit size.

The upper part of the canopy tends to be more open, setting less fruit that tends to be larger; therefore it will not be so critical to prune this part of the canopy.

Top Worked trees - Different Technique Required

Top worked trees have been found to produce multiple, dense branches which because of the very vigorous growth tends to be long and whippy. This type of structure causes many fruit to be produced a long distance from a strong branch and this fruit is usually small.

Therefore in addition to the technique used on maiden trees, these long, whippy branches need to be removed or thinned out and their length reduced.

2,4-DPp Spray (Corasil) - Fruit Size Enhancing Spray

If a heavy fruit set is anticipated then an early Corasil spray when fruitlets are approximately 12mm in average diameter will assist in removing the small fruit from the tree. If the anticipated fruit set is moderate, then spray when fruitlets are larger (18 – 20 mm). Refer to the product label.

The effect on fruit quality will be minimal and should increase fruit size by up to one count.

Alternatively, 3,5,6-TPA Spray (Tops) - Fruit Thinning Spray

If despite all the above cultural practices, there is still too many fruitlets, then a fruit thinning spray with 3,5,6 TPA could be considered.

This should be used as the last resort, and local experience is essential, due to the potential of excessive fruit drop.

It is very important to follow label recommendations.

Crop Density

It is important to have a balanced crop density and to measure it regularly every season to maintain the best yields, size and quality.

The optimum count frame is 4 to 5 fruits per frame (0.5 x 0.5 x 0.5 m). If density is significantly higher, it will be important to remove some of the fruitlets by direct hand pruning. This should be done as soon as possible after physiological fruit drop.

Foliar Nutrient Sprays - Potassium Nitrate and Calcium

Regular foliar sprays with potassium nitrate will enhance fruit size development.

It is particularly important to apply potassium nitrate at the end of fruit set (early November in the Sunraysia region) around the same time as the fruit size enhancing spray (2,4-DPp Corasil).

A regular application of potassium nitrate at 2% during summer is recommended when crops are heavy.

Also applications of calcium and other nutrients and trace elements are recommended particularly, with heavy crops.

Nutrition - Fertigation

The most important demand for nutrition is during the spring flush, fruit set and cell division.

In general, M7 compared with other navel varieties will require an increase in the fertiliser rates during spring flush (September – October) by 50% and during cell division (November – December) by 50%. Fruit quality should be monitored in case this strategy needs adjustment.

The fertiliser program should be completed by early February to allow the fruit rinds to smooth out.

For a normal cropping situation, the fertiliser program should be around 100-120 units of N, 30-45 units of P and 120-150 units of K.

Following very heavy crops, an N-P-K post-harvest fertiliser application of 10 to 25 units of N, P and K is recommended.

Indicative fertigation nutrient application program

| | N | K |
|-------|------|------|
| Sep | 20% | 10% |
| Oct | 30% | 10% |
| Nov | 15% | 15% |
| Dec | 15% | 15% |
| Jan | 10% | 25% |
| Feb | 10% | 25% |
| Total | 100% | 100% |

If fruit rind texture tends to be coarse, foliar sprays of MPA or increased rates of phosphorus in the fertigation program should reduce this incidence.

Others - Flower Pruning, Hand Thinning

If at flowering time, there is a very heavy bloom, it may be advisable to prune lightly (by cutting only small flowering branches) to thin out part of the bloom.

If at the end of fruit set (early January) there are excessive fruitlets, some pruning directed to thin the excessive crop may be advisable.

If despite best practice, there is still an excessive crop in late January; consideration could be given to some hand thinning to remove the smallest fruit. This however, along with pruning at the end of fruit drop, should not be necessary if the above procedures on GA sprays and pruning during Winter are followed.

Young Tree Foliar Sprays

For the first two years after planting or top-working trees, it is recommended that monthly foliar nutrient applications during the growing season, be used to maximise growth.

Nitrogen, magnesium and trace elements should be used along with amino acids and other growth stimulants.

A low rate of copper should be mixed with every spray (e.g. 25 g/100L of copper oxide or copper chelate). Control aphids and leaf miner by using an IPM strategy.

Trunk Guards on Young Trees

Trunk guards if too tight or do not have enough ventilation, can cause phytophthora infection of the bark under the guard, particularly if cracks occur there. Guards must be removed as soon as they are no longer required for protection from herbicides. This is usually possible 30 to 36 months after planting.

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