



M7 Orchard Protocol

July 2022

A Unique Variety

Very Early, High Quality, High Value

M7 is a highly sort after, very early maturing navel with high eating quality. Also, it has high rind integrity allowing delayed harvest to target high brix markets.

Although some growers have encountered challenges with the variety, others are consistently producing high yields of large, high-quality fruit, with minimal special treatments, and rate it as one of their most profitable varieties. Growers need to be very proactive in their management from planting to maintain vigour and balanced crops. Planting recommendations can be found on chislettfarms.com.au

Successful production of quality fruit therefore, requires some specific treatments that would not be essential for other navel varieties.

NB. Some products in table 1 may not be permitted or may have maximum residue limit considerations in some growing regions.

Key factors: Vigour and tree health, balanced crops, fruit density and role of copper

Stunting

The vast majority of trees which grow normally to maturity without signs of stunting, continue as healthy trees. Plantings of 15-year-old trees remain very healthy. In recent plantings, the propensity for stunting is approximately 3 to 6 % of trees. The percentage does not seem to be related to the rootstock used, although it is advised that C35 not be used as it seems to have a higher incidence. Sectioning of the graft union does not indicate conventional incompatibility with the rootstock and extensive trials and research have not found a cause. Currently, the most plausible explanation, is that stress factors in the tree early in its life can cause a permanent 'obstruction' to establish resulting in retarded growth. This stress could be things like under or over irrigation, or over cropping. The incidence of stunting in Australia is reducing with improved growing methods and is not considered a significant problem by successful M7 growers. The use of an interstock appears to reduce the problem but does not eliminate it.

Rootstocks

All regular rootstocks have been used successfully, however, more vigorous rootstocks have been found to give larger fruit and although those like Volkameriana and Macrophylla tend to reduce internal fruit quality, M7 has such high brix and balanced acid levels, these can be used successfully. The susceptibility of Macrophylla to tristeza needs to be considered in some locations.

Topwork Grafting

Older trees are usually compromised by soil-borne pathogens which can reduce vigour, and it has been found difficult to produce large fruit when M7 is grafted in this situation. Topworking is therefore not recommended.

Replanting

When planting where citrus has previously been planted, it is important to rest and/or treat the soil and/or plant a brassica crop to reduce pathogen populations.

Stress Reduction and Tree Vigour

Because M7 has a very short period between flowering and harvest, maximising fruit growth is essential. Any factor that causes stress on the tree should be avoided and strategies to enhance fruit sizing implemented. These include:

- Monitor and maintain soil moisture.
- Seaweed products applied to the foliage and or roots, particularly effective in sandy soils.
- Sunscreen applications (kaolin etc).
- Plant under protective netting (a trend for citrus in some areas).
- Prevent overcropping,
- Other antistress treatments.

M7 nursery trees can fruit very heavily the first year or two after planting in the orchard. This should be avoided as it reduces vegetative growth when we want to maximise tree size, and it could contribute to initiating stunting of some trees.

Copper Nutrition

If special applications of nutritional copper are not applied, copper deficiency symptoms (bark cracking, twig dieback, gumming, large leaves, 'snaking', multiple budding and dark green foliage) appear and growth is retarded. Therefore, foliar applications of copper chelate are essential.

Copper gluconate in Sergomil L60 has proven to be superior to other products trialled, is compatible with most sprays, and can be used at flowering without affecting fruit. 3 to 5 applications during the growing season are recommended. Refer to spray program table 1 below.

Copper can also be applied through drip irrigation (e.g., copper chelate EDTA).

Leaf tissue analysis should be conducted in autumn to monitor the concentration of copper and other elements. It is imperative to wash (manually scrub with neutral soap and rinse in distilled water before submitting the sample) to remove any surface contamination. This allows the true leaf content to be determined as surface copper residue can give false high results.

Copper analysis should be higher than 20 ppm and preferably above 40 ppm. The Australian Guideline minimum of 5.1 ppm has been found to be too low for this variety to prevent deficiency symptoms.

Obscure Flowering

Research has found that a much higher proportion of M7 flowers produce fruit, than any other navel variety, and this potential overcropping needs to be prevented.

Many flowers can be hidden in the canopy causing growers to predict a very light crop, only to realise a final crop with too much fruit and fruit smaller than desired.

It is important to take action early, if it is anticipated that a reduction in fruit density is required, by considering treatments 1 and or 2 following an “off” crop. Then assess fruit density immediately after flowering, and if appears to be too high, treatment 5 can be used to thin.

High Fruit Density

Precociousness is a positive characteristic but with M7 it needs to be controlled to ensure large fruit size. Also important is preventing fruiting for the first two years after planting to allow the tree to maximise vegetative growth and reduce the potential of initiating stunting (treatment 1).

Fruit Splitting

Under some conditions, fruit can be susceptible to splitting. This mainly occurs from the navel end of the fruit where the rind is thinner, and to a lesser extent along lateral lines of weakness, which appear under some growing conditions. The incidence can be reduced or eliminated by maintaining good copper nutrition (copper strengthens cell walls) and following treatments which strengthen and thicken the rind:

- Monitor and maintain soil moisture
- Calcium foliar sprays
- Auxins applied at flowering to close the navel and thicken the rind
- Prevent overcropping which causes thin rinds
- Adequate, balanced NPK applications (aim for 3.0 % nitrogen in leaves)
- Balance crops by maintaining vegetative vigour

Pruning

Annual removal of 25% to 30% of the canopy is highly recommended. In general, this is best done by manual removal of the small, weaker limbs throughout the canopy, particularly in the lower part where there is a tendency for the canopy to be too dense, producing small fruit, and this needs to be thinned out. The upper canopy tends to be more vigorous and open requiring less attention.

Maintain Vigour

Some Australian growers reduce stress on the tree and maintain vigour and balanced crops by injecting bio stimulants into their irrigation water. For example, 10 litres of Seasol per hectare four to five times during the growing season. They find that apart from addressing the higher copper requirement, treatments 1, 2, and 5 in table 1 are not required.

Treatment 1 is highly recommended to prevent fruit setting in the first two seasons after planting, and treatment 4 to reduce fruit splitting after that.

Treatment 6 is always applied.

Treatments 5 may only be necessary if the trees are set-back for some reason and do not maintain vigour from planting or if seasonal conditions promote a heavy flowering and or fruit set.

Note: Growers are advised to read carefully notes in Table 1. Chislett Farms are always available to answer any queries growers have.

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Table 1**RECOMMENDED SPRAY PROGRAM**

Treatment	Timing (SH - NH)	Product	Rate	Notes
1	Winter GA to reduce fruit density. Mid June (SH) - Mid December (NH)	GA3	10 to 20 ppm	To reduce flowers and produce more leafy inflorescences. 1st and 2nd year after planting: 2 applications at 20 ppm. 3rd and 4th year: 1 application at 20 ppm. 5th year onwards: 10- 20 ppm. Only when required, particularly following light crops and potential heavy flowering
2	Bud break GA in late July (SH) - late January (NH) when buds are 2 to 5 mm long	GA3	3 - 5 ppm	Normally 5 th year onwards to reduce flowers and to produce more leafy inflorescences, to regulate flowering and balance crops
		LB Urea	1%	
		Copper chelate (Sergomil)	Label rate	
3	Pre-flowering nutrient at 1/2 spring leaf development. September (SH) - March (NH)	LB Urea	1%	Regular spray to improve the quality of flowers and to avoid deficiencies of trace elements. Check with your supplier the compatibility of all products and the best chelated forms of micronutrients to use
		Copper chelate (Sergomil)	Label rate	
		Seaweed (Ascophyllum), glycine betaine (GB)	Label rate	
		Mg, Ca, B, K, Zn, Mn, Mo	Label rate	
4	Petal fall auxin to close navel at 50 to 80% petal fall. Mid October (SH) - Mid April (NH)	2,4-D (Stop Drop)	5 - 10 ppm	Different alternative auxins could be used: 2,4-DP (Corasil, Clemengros) at 10 ppm or MCPA (Fenotiol) at 10 ppm. When applying auxins, it is important to include biostimulants: seaweed and glycine betaine (GB) to reduce the stress. Check with your supplier the compatibility of all products and the best chelated forms of micronutrients to use. Maintain good irrigation and do not spray stressed trees (heat wave etc)
		Copper chelate (Sergomil)	Label rate	
		Seaweed (Ascophyllum), GB	Label rate	
		Ca, B, K, Zn, Mn	Label rate	
5	Auxin for thinning: 3,5,6-TPA at 10 ppm when average fruit diameter is 18 mm (will drop fruit less than 15mm). Auxin for sizing: 3,5,6,-TPA at 15 ppm when average fruit diameter is 22 mm	3,5,6-TPA (Maxim)	10 - 15 ppm. Maximum 30 tablets/ha	Different alternative auxins can be used to increase fruit size when thinning is not required. 2,4-DP (Corasil, Clemengros) at 20 to 40 ppm or MCPA (Fenotiol) at 10 to 15 ppm or 2,4-D (Stop Drop) at 10 ppm. Do not apply more than two auxins in one season to avoid reduced quality. When applying auxins, it is important to use biostimulants: seaweed and glycine betaine (GB) to reduce stress in the tree. Check with your supplier for advice on rates, spraying conditions and compatibility with foliar nutrients and the best form of chelates to use. Maintain good irrigation management and do not spray stressed trees (heat wave etc).
		Copper chelate (Sergomil)	Label rate	
		Seaweed (Ecklonia/ Ascophyllum), GB	Label rate	
		Ca, B, K, Zn, Mn	Label rate	
6	Summer GA in late December to early January (SH) - Late June to early July (NH) when average fruit diameter is 30 to 40 mm	GA3	20 ppm	Regular summer GA to improve skin flexibility and to reduce albedo breakdown and splitting. Check rates, spraying conditions, compatibility with foliar nutrients, and the best form of chelates to use, with your supplier. Maintain good irrigation management and do not spray stressed trees (heat wave etc).
		Copper chelate (Sergomil)	Label rate	
		Seaweed (Ecklonia/ Ascophyllum), GB	Label rate	
		Ca, B, K, Zn, Mn	Label rate	