

KEY CROP MANIPULATION PRACTICES

1. FLOWER SUPPRESSION / REGULATION

- > Flower bud potential is usually determined during June / July in southern Australian citrus regions.
- > It is usually difficult to tell the difference between flower buds and leafy buds until early spring.
- > An application of GA3 in winter can reduce flower numbers in the following spring.
- > Ralex is the only product registered to reduce flower numbers in citrus.
- > GA3 helps to lower the number of shoots only with flowers or 'white blossom' and increases the number of leafy or 'green' blossoms.
- > Green blossom or flowers with leaf around them set more fruit and have faster growth rates, meaning bigger fruit at harvest.
- > There are two timings for the application of GA3 :
 - The first is approximately mid-late June.
 - The second is as shoots emerge or at bud burst when they are round 1-2 mm long - this timing is typically late July / early August.
- > When applying GA3 it is imperative the instructions on the label are followed and it is then trialed in orchards where current crop levels are low or biennial bearing exists - this practice needs to be fine tuned to your individual property.
- > Good coverage of GA3 is essential, therefore normal spray volumes must be applied to effectively cover the tree's buds.

2. PRUNING

- > Pruning aims to consistently produce a good quality crop of large fruit on strong new branches and flush.
- > Pruning also helps achieve a balance between vegetative growth and fruiting wood by reducing the crop and canopy area.
- > Pruning helps improve light penetration and spray coverage.
- > Light entering the canopy is possibly the greatest benefit of pruning because it allows fruiting wood to grow inside the tree.
- > Fruit growing inside the canopy is better protected from high and low temperatures and wind blemish, and it is consistently larger.
- > Pruning helps produce even-coloured fruit throughout the canopy.
- > Pruning reduces the amount of dead wood on a tree which can cause wind rub on fruit. Wind rub lowers the ranking of fruit to second grade.
- > Pruning keeps trees at a manageable size by maintaining a lower height and structure for easier management and harvest.
- > Ideally pruning should be performed immediately after harvest.
- > Cost and time are important factors to consider when planning what or how to prune.
- > Hedging is a quicker and cheaper alternative form of pruning and is used when drastic action must be taken. It has some negatives - it is not selective and can induce a hedge-like flush that will be more prone to the tree flowering all at once in the following year unless manipulated.

3. THINNING / SIZING WITH CHEMICALS

- > An opportunity exists to improve fruit size near the end of natural fruit drop when fruitlets are 10 to 15mm in size.
- > Products that are registered for this purpose in Australia include Ethrel and Corasil, while Tops is available for limited use under permit.
- > All these products must be used with great care and common sense.
- > To consider these products the fruit load on the tree must be heavy to warrant thinning - this is for Ethrel and Tops. Corasil will act more as a fruit sizer and aid in cell expansion for example, it will make cells in the fruit bigger, hence producing larger fruit.
- > Trees must be in good health and not stressed.
- > Ensure good moisture levels - irrigate prior to spraying and after if necessary.
- > Slow drying conditions should be avoided.
- > Weather forecasts should be checked prior to application and the immediate days following - extreme heat is of particular concern.
- > Good and accurate calibration of spray equipment is particularly important when applying plant growth regulators as good coverage is essential.

BALANCED CROP = MORE \$\$\$\$\$\$

CITRUS FRUIT SIZE MANAGEMENT CALENDAR & CHECKLIST



ASSESSMENT: CURRENT CROP LOAD, PAST HISTORY, TREE HEALTH STATUS, HARVEST TIME AND LEAF ANALYSIS

	TIME	GROWTH STAGE/PHASE		ACTION CHECKLIST	
WINTER	MAY to JUNE	Floral induction and initiation - transfer of resting buds to floral buds		Flower manipulation spray (Ralex) Pruning after harvest	<input type="checkbox"/> <input type="checkbox"/>
	AUGUST to MID SEPTEMBER	Pre bloom / bud break Bud break and flower development		Pruning Adjust nutrition to suit crop loads Nutrient foliar sprays	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
MID SEPTEMBER to MID DECEMBER		Flowering / full bloom and fruit set Cell division and physiological fruit drop		Adjust nutrition to suit crop loads Chemical thinning & sizing - Ethrel, Corasil, Tops Light hedging Nutrient foliar sprays	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	SUMMER	ASSESS CROP LOAD / DENSITY COUNT & FRUIT SIZE <input type="checkbox"/>			
MID DECEMBER to APRIL		Fruit growth / cell expansion		Hand thinning Foliar potassium nitrate spray(s) Adjust nutrition to suit crop loads	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
AUTUMN	MAY	Maturation / harvest		NOTE: Blocks harvested late have a greater risk of producing lower crops in the following year.	<input type="checkbox"/>

Contact your local Value Chain Coordinator/IDO for more advice regarding your region. For more information go to: www.citrusaustralia.com.au

GETTING IT RIGHT

KEY CROP MANIPULATION PRACTICES

4. HAND THINNING

- > This is the last management tool available to change crop load and fruit size before harvest.
- > Hand thinning can be costly and time consuming but is very selective and accurate when done properly.
- > For the best effect on fruit size, hand thinning should be carried out as early as possible.
- > Research suggests up to 20% of fruit needs to be removed to see any positive impacts.
- > When hand thinning some basic rules and principles are:
 - Remove damaged fruit first for example, wind blemished or fruit damaged by pests such as thrips or mealy bug.
 - Remove fruit that are small for example, smaller than average or smaller than what fruit should be at that specific time of the year.
 - Thin clusters to one or two fruit - unless they are all big. Fruit that are large early tend to be big at harvest.
 - Avoid fruit touching each other.

5. NUTRITION

- > At the centre of all good fertilizer and nutrition programs should be regular leaf analysis, and good record keeping which includes yields per orchard/hectare and density counts which can be used to monitor changes.
- > Citrus trees require optimum nutrition at each growth stage to promote better fruit size and tree health.

FLOWERING - INITIAL SET (June - October)

- > Apply 40% to 50% of annual nitrogen in two split applications at bud swell.
- > Apply 50% (fertigation) or 100% (banding) of annual phosphorous before and during bloom.
- > Apply 30% to 40% of annual potassium.
- > Apply Nitrogen - Phosphorus and Potassium mixes between September and November.
- > Zinc is critical, apply foliar sprays as required.
- > After fruit set apply magnesium and manganese foliar sprays as required.
- > Adding low biuret urea (0.5%) to sprays with zinc and manganese helps uptake.
- > Ensure adequate supply of calcium to reduce albedo breakdown.
- > Apply 30-50% of annual potassium after fruit reaches 10mm in size.
- > Apply foliar micronutrient sprays as needed.
- > Experience shows that foliar sprays of potassium phosphite or MAP in November will improve fruit size.
- > Potassium nitrate sprays should be applied at 1% to 3%.

STAGE 2 FRUIT GROWTH (January - April)

- > Nitrogen is still important at this time - apply 25% of annual requirement (adjusted for crop load) throughout this period. Be aware that high levels of nitrogen will delay maturity.

STAGE 1 FRUIT GROWTH (November - December)

- > Apply 25% of annual nitrogen in November after fruit set and at the end of the vegetative growth flush.
- > Calcium nitrate is preferable to ammonium nitrate and urea as these forms of nitrogen compete with the uptake of calcium leading potentially to albedo breakdown issues.
- > If fertigating, apply the remaining phosphorous (50%) at monthly intervals from October onwards.
- > Ensure adequate nitrogen levels of carbohydrate reserves for next season's flower initiation in winter. This will help to reduce biennial bearing and give balanced crops.
- > Potassium continues to be important - apply 30% of annual requirement after the final fruit drop stage in January and February.
- > The nitrogen: potassium ratio is important - ideally ratios should be 2:1.

CONTRIBUTORS



SA Citrus Board
South Australian
Citrus Industry Development Board



CITRUS GROWERS of SOUTH AUSTRALIA

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For more information go to:
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CITRUS FRUIT SIZE MANAGEMENT CALENDAR & CHECKLIST

ACTION CHECKLIST

1. FLOWER SUPPRESSION / REGULATION



3. THINNING / SIZING WITH CHEMICALS



2. PRUNING



4. HAND THINNING



5. NUTRITION

