

Chemical thinning of citrus

Sandra Hardy

Industry Leader, Citrus
NSW DPI, Gosford Horticultural Institute

Steven Falivene

District Horticulturist, Intensive Industries
Development, NSW DPI, Dareton

Introduction

Chemical thinning compounds can be used in citrus to reduce heavy crop loads by reducing the number of fruitlets on a tree. Chemical thinning normally reduces crop loads by 20–30% and should only be considered for trees carrying a heavy crop load. For guidelines on how to measure crop load see Primefact 787, *Assessing citrus crop load*.

Ethrel® is registered for use on Washington navels, Valencias and Imperial mandarins. At present there is only one chemical – ethephon, sold under the trade name Ethrel®, registered for thinning citrus.



Heavy crop loads can warrant chemical thinning.



Measure 25–50 fruit with calipers to determine fruit size. Digital calipers are easier to use than dial readout calipers.

Ethrel® has been shown to cost-effectively thin fruit in navel and Valencia oranges and Imperial mandarins carrying a heavy crop load. The amount of fruit removed by Ethrel® can vary depending on crop load, application rate and climatic conditions. Trees sprayed with Ethrel® should start to drop fruit within 7–10 days of application.

Growers in the past have reported mixed results with chemical thinning, usually as a result of poor timing or over-application. Excessive spray volumes can overdose trees and cause excessive leaf and fruit drop. However, if used carefully under the right environmental conditions it can be a great management tool to increase fruit size by reducing crop load. It is important to start by trialing a small number of trees on your property to finetune the use of Ethrel®. It is also important to keep good records of application volumes and timing, crop load and weather conditions to build up a picture of how Ethrel® can best be used on your trees to achieve the desired results.

In 2001, 12 sites were sprayed in Sunraysia with no adverse effects reported. Ethrel® trials in Sunraysia on Washington navel trees carrying a

heavy crop dropped about 20% of fruit, increasing net returns by 15–25%.

Application timing

Timing is critical. The correct time to apply Ethrel® is near the end of the natural physiological fruit drop period when fruitlets are 10–15 mm in size. This period is generally between November and December for most varieties.

Measure 25–50 fruit twice weekly and monitor fruit drop to determine when the end of the natural fruit drop period occurs.

Weather conditions

Weather conditions influence the degree of thinning. Do not apply Ethrel® in very hot (over 35°C) or cool weather (below 18°C). High temperatures can increase the amount of fruit drop. Avoid spraying in the afternoon or in slow drying conditions. Do not apply if rain is likely within 1–2 days after spraying.

Tree and crop condition

The crop load on the tree must be heavy to warrant the use of chemical thinning. Trees need to be healthy and in good condition and not be stressed. Ensure good soil moisture – irrigate trees two to three days prior to spraying. If trees are water stressed they may suffer excessive leaf or fruit drop. Avoid spraying after heat wave conditions; wait a few days until trees recover.



Ethrel® sprayed at the end of the natural physiological fruit drop period when fruitlets are 10–15 mm in size can significantly reduce crop load.



Trees sprayed with Ethrel® had fewer fruit but larger fruit size than unsprayed trees carrying a heavy crop.

Chemical rates

The rates for Ethrel® vary for different citrus varieties and regions. In NSW, rates of 50–60 ml/100 L water are recommended for navel and Valencia oranges and Imperial mandarins. The higher rates are recommended for very heavy crop loads. Always refer to the product label for directions of use.

Spray application volumes

Ethrel® should only be used as a dilute spray and is not appropriate for concentrate spraying.

Calibrating your spray equipment before applying Ethrel® is critical. Exceeding recommended spray volumes can increase the risk of excessive leaf and fruit drop. Adjust the volume rate according to the size of your trees to achieve an even coverage of the canopy to the point of runoff. Spraying past the point of runoff may overdose trees and cause excessive fruit and leaf drop.

Correct calibration of spray equipment will help to ensure that actual tree canopy dimensions are used to determine the correct spray volumes for each block of trees. From local experience it is best not to exceed spray volumes of 3500 L per hectare.

A high spray volume to achieve an even spray coverage of the tree canopy to the point of runoff (before spray starts to drip from leaves) is recommended. Aim to apply 13–15 L of diluted spray to each 4–5 m high single spaced tree (i.e. 220 trees/ha). For double spaced trees, spray volumes per tree will have to be reduced to avoid overdosing.

Do not use alkaline water for application. Do not use surfactants or wetting agents as leaf fall may be increased.

There is also a re-entry period of 48 hours for treated areas. When prior entry is necessary, cotton overalls, elbow length PVC gloves and goggles must be worn.

Best practice tips

- For chemical thinning, only spray trees carrying a heavy crop load.
- Apply Ethrel® towards the end of the natural physiological fruit drop period (November–December) when fruitlets are 10–15 mm in size.
- Read and carefully follow label directions before use.
- Spray equipment must be correctly calibrated for each block of trees to be sprayed.
- Ensure an even spray coverage of the tree canopy and only spray to the point of runoff.
- Do not exceed a spray application volume of 3500 L per hectare.
- Do not spray if rain is predicted up to 48 hours after application.
- Do not spray in cool weather (below 18°C), in slow drying conditions or in the afternoon.
- Do not spray in very hot conditions (over 35°C) or immediately after heat wave conditions.
- The water for spraying should not be alkaline.
- Do not use surfactants or wetting agents.

References

Bevington, K & Khurshid, T 2002, *Optimisation of citrus production and fruit size: an interactive management model*, Horticulture Australia Limited final report project CT98023.

Bevington, K, Hardy, S, Meville, P, Thiel, K, Fullelove, G & Morrish, P 2003, *Fruit size management guide, part 1*, an Australian Citrus Growers publication.

Bevington, K, Hardy, S, Falivene, S, Khurshid, T, Fullelove, G & Morrish P 2003, *Fruit size management guide, part 2*, an Australian Citrus Growers Publication.

Related Primefacts

Primefact 789 – *Hand thinning citrus*

Primefact 787 – *Assessing citrus crop load*

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ISSN 1832-6668

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Always read the label

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Job number 8712