

Spray thinning for crop load management of fresh market plums

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Spray thinning for crop load management of fresh market plums

- Most plums set excess fruit, leading to poor size development and low pack outs of marketable fruit
- Hand thinning usually occurs later than the optimal timing (as early as possible)
- Hand thinning can cost \$3000-4000/ha in labour
- Spray thinning practiced in pome fruit for 50 years

Spray thinning for crop load management of fresh market plums

- Plums can often exhibit a synchrony of flowering, whereas apples have a sequence of crown bloom, followed by secondary florets
- Spray thinning is needed to improve pack outs of marketable fruit to be export competitive with Chile and South Africa

Spray thinning for crop load management of fresh market plums



- Plum exports are rising rapidly with many new orchards commencing to bear in Victoria

Spray thinning for crop load management of fresh market plums

- Conducted 5 replicated experiments in 2017
- Tested ethephon, a plant growth regulator that generates ethylene, a natural plant growth regulator at 75 and 150 ppm, alone or tank mixed with NAA, a synthetic auxin @10 and 20ppm
- Applied from full bloom to 30 days after bloom

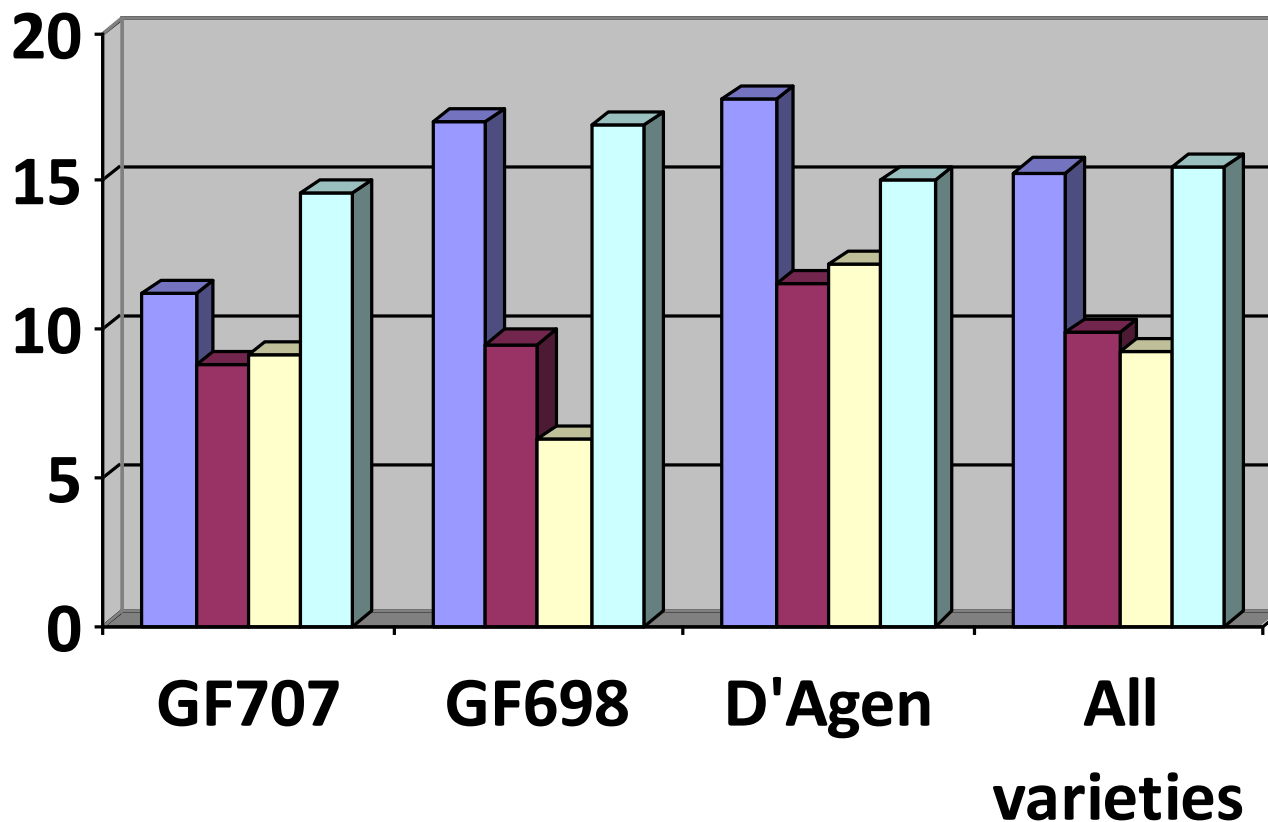
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- Five replications of each treatment, comprising single tree plots, hand sprayed
- Assessed fruit set and fruit size.

Spray thinning for crop load management of fresh market plums

- 75 and 150ppm significantly reduced fruit set and increased fruit size
- Addition of 10ppm NAA to ethephon increased the effectiveness of the spray treatment

Effect of ethephon and NAA treatments applied at full bloom on percentage fruit set of European plums, Cobram, 2017



■ untreated

■ ethephon 150 ppm

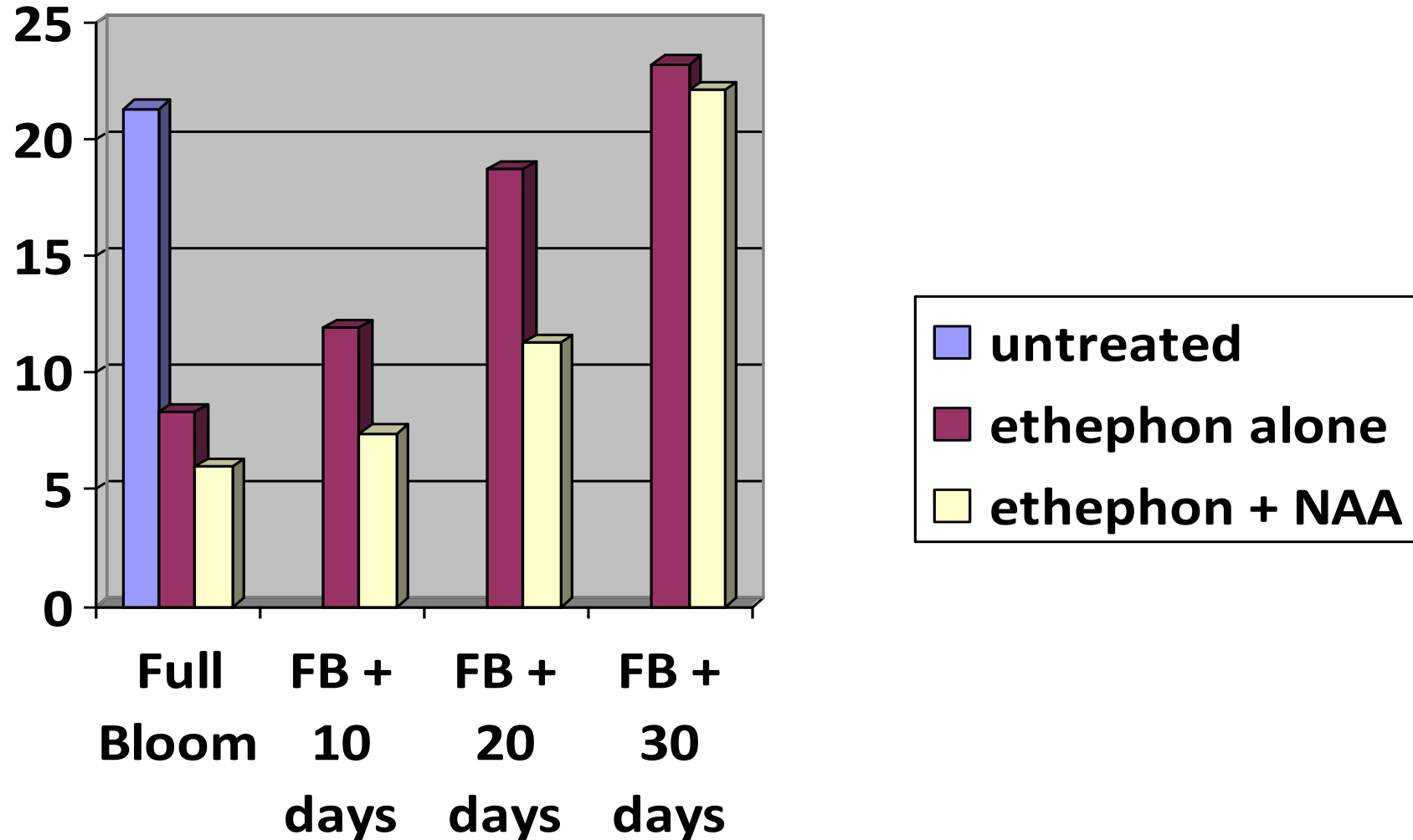
■ eth 150 ppm + NAA 10 ppm

■ NAA 10 ppm

Spray thinning for crop load management of fresh market plums

- Timing at the full bloom to 15 days after blossom gave the best thinning and increase in plum size.
- Confirmation in a second season required
- Testing needed on alternate stone fruits such as peaches and nectarines

Effect of application timing of ethephon @ 150 ppm (alone or tank mixed with NAA @ 10 ppm) on percentage fruit set of GF698 plums, Cobram, 8th November 2017



Spray thinning for crop load management of fresh market plums

- Results will be submitted to the APVMA to obtain a minor use permit for this technique
- Enable Australian plum growers to increase their international competitiveness, by producing better pack outs of high quality fruit at a lower cost

Spray thinning for crop load management of fresh market plums

- Murray and Goulburn Valleys are ideally suited to fresh plum production
- Adequate winter chilling that is not available in coastal or more northerly areas
- Most reliable water supply in the Murray Darling basin
- Suitable soil types
- Large farm sizes

Spray thinning for crop load management of fresh market plums

- Project was conducted efficiently by experienced people
- Literature search gave us understanding of prior knowledge
- Industry collaboration ensured the project addressed a critical unmet challenge in stone fruit production
- Results demonstrated consistency between trials.

Spray thinning for crop load management of fresh market plums

- Investment from the HIF has enabled the project to proceed and fill a market failure
- Encourage any horticultural industry with a commitment to quality R&D to apply for support if their project will advance Victorian production horticulture.

Summary

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- Five replicated field trials were conducted near Cobram, Victoria to study the effect of ethephon and NAA (alone or in tank mixtures) on the fruit set of European plums.
- Treatments in three experiments comprised ethephon @ 75 and 150 ppm +/- NAA @ 10 and 20 ppm applied at full bloom or 15 days after full bloom (DAFB), a commercial standard of ammonium thiosulphate @ 1.0% v/v and an untreated control.
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- Rate responses to ethephon and also the effect of application timing were studied in the additional two experiments.
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- Ethephon proved an effective plum thinning treatment when applied at the full bloom – 15 DAFB period.
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- An effective rate of ethephon would appear to be <150 ppm. Addition of NAA to ethephon increases the effectiveness as a thinning spray during the optimum application period.
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- Applications of these thinning treatments appeared to lose their effectiveness when applied > 15 DAFB.
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- Epinasty of shoots and leaf rolling was observed with NAA @ 20 ppm; suggesting that the rate of NAA in these treatments should not exceed 10 ppm. Addition of NAA to ethephon may improve efficacy, thus lowering the ethephon dose to avoid the risks of gummosis.
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- Further rate definition studies are warranted to refine recommendation for use. Suggestions for use would be ethephon @ 50 - 100 ppm plus 5 - 10 ppm NAA applied at full bloom with possibly lower rates required in the following 15 days.