

APPLES

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Fruit Thinning Edition

6-BA (Exilis and MaxCel)

Is a growth promoter of both shoots and fruitlets, the large fruitlets out-compete the small ones. Application window is 7 to 15mm king fruitlet diameter (optimal 10 to 12mm). Temperature in the week after spraying greatly influences the result. Below 15°C, no thinning occurs. Ideally 20-25 °C for three days after spraying, but certainly it needs a rising temperature trend after application.

6-BA + NAA Mixes

Combining Exilis plus Fixor (NAA) improves the consistency of the thinning effect, and also reduces the temperature dependency somewhat, though results will still be disappointing below 15°C. Beware the risk of pygmy fruit in sensitive varieties (e.g. Gala) if Fixor is applied after 10 mm fruitlet diameter. To get around this, you can apply Fixor early, as a separate spray, and follow up with Exilis as temperatures improve, as fruit size grows beyond the 10 mm stage, but before 15 mm. The improved thinning effect will still be achieved. When applying 6-BA, remember to add X-Clude water conditioner to buffer the pH of the spray solution, especially if you are in a hard water area, where pH may be above 7.

Brevis

Brevis is a powerful thinning agent: it is the first thinner that is capable of significant over-thinning.

Brevis: a systematic approach

1. Decide on target fruit number and % fruitlet removal required (plan to leave 5-10% extra for drops and hand thinning for quality)
2. Categorise Each Orchard in Advance:
 - A. Thin under no circumstances – too young (< 4 years old), very vigorous trees, poor set, fruit size historically too large, poor cropping history.
 - B. May require thinning with a low dose – sensitive varieties, indeterminate set, trees 4-6 years of age. 1.1 to 1.6 kg/ha. Consider application to the upper parts of the tree only, as these are less shaded, so are less prone to being over-thinned by Brevis (and more expensive to thin by hand).
 - C. Normally requires thinning – assess variety and vigour - Mid range dose 1.6. Consider application to the upper parts of the tree only.
 - D. Requires comprehensive thinning – history of overset, appearance of overset, history of undersize fruit, normal vigour – 2.2kg/ha (maybe followed by 1.6 kg/ha applied to the upper parts of the tree). Think very carefully before using this rate.
3. Watch weather conditions, weather forecast and fruitlet size.

Degree of thinning achieved

Brevis inhibits leaf function, simulating the effect of shading. The extent of thinning following Brevis application is only partially related to rate applied. Weather conditions, particularly night temperatures, in the 5 days before application influence the level of carbohydrate reserves in the tree. Warm nights promote active respiration and carbohydrate utilisation; reserves are reduced, so the tree becomes more susceptible to thinning by Brevis. Similarly, cloudy days and low light levels in the time after application further decrease the rate of photosynthesis and increase the thinning effect.

Weather effects account for around 65% of the variability in thinning effect – the other 35% is less clearly understood, but involves an interaction of humidity at the time of application (high humidity promotes uptake and

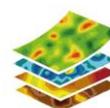
Further information please contact Jonathan Blackman: 07774 738213. jonathan.blackman@hlhld.co.uk
H.L.Hutchinson Ltd., Weasenham Lane, Wisbech, Cambridgeshire, PE13 2RN.



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TerraMap

increased effect), tree age, vigour, blossom intensity and pollination, and the degree of fruitlet differentiation, among other factors.

Hutchinsons Agronomists have access to the Brevismart model that helps to identify suitable weather windows, for application and will assist with information to help growers make good decisions, **but the variability of the thinning effect is such that the use of Brevis must ultimately be a grower's decision, made at grower's risk.**

Other considerations

Application – high water volumes and/or high relative humidity = increased effect. Remember the label stipulates a maximum concentration of 220g/100 litres, and a water rate of 400 to 1000 litres/ha.

Application timing – in trials, thinning effect was observed between 6 mm and 18 mm, with maximum effect at 13 mm; up to that point, effect increases with increasing fruitlet diameter. Measure fruitlets on 2 year old wood, and assume 0.5 mm per day increase. But *remember – weather conditions have a greater effect on variability than fruitlet diameter at application.*

One or two applications?

Deciding if a second application is needed is very difficult, as you are likely to need to make the decision before the effect of the first application is easily seen. After Brevis application, fruitlets that will be removed stop growing almost immediately. The difference in growth rates can be measured before it can be seen. Information about the extent of thinning effect is useful in deciding if a further application is necessary. The Greene Model is under development and is intended to assist growers in making the decision. If a two application sequence is planned, the first application should be at 10-12 mm and the second 5 days to 10 days after the first.

The Greene Model Growth Measurement Protocol

Fruit diameter:

- Timing of measurements:
 - 1st - on day of application,
 - 2nd 7-8 days after application
- Label the clusters from 1 to 40 just prior to thinner application
- Mark all fruits with numbers from 1 to XX, also put two points on the fruits so that the diameter can always be measured at the same place. Easiest is to use a fine marker, or a Tipp-ex brush.
- Measure the fruits on the day of application and 7-8 days later.
- Record the diameter; measure with a digital calliper on the same place each time. Placing the mobile calliper part on Tipp-ex mark and take the diameter reading horizontally.



Calculation:

- Calculate the fruit growth from every individual fruit.
- Calculate the average fruit growth of the 20 fast growing fruits.
- Divide this fruit growth by 2: every fruit that grows less than this is predicted to fall.
- If measuring starts at 8-9 mm (early application), you can decide, based on this, on 13-14 mm fruit size application timing.
- This is laborious, takes around 4 hours, but hand thinning takes a lot longer.

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