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NOW
REGISTERED
FOR USE IN
APPLES AND
PEARS, WITH
EXPANDED
USE RATES

Brevis[®]

Widens your application
window for fruit thinning.

Product Guide

 GROWTH
REGULATOR

[ADAMA.COM](https://www.adama.com)



Brevis provides Australian apple and pear growers with an innovative and flexible option for fruit thinning.

At a glance

- Registered for use in apples and pears
- Unique mode of action inhibits photosynthesis to induce fruit thinning
- Apply in daily temperatures of 10°C to 25°C
- Apply between 8 and 16 mm fruitlet diameter
- Apply up to two applications at a rate of 1.1 to 2.2 kg/ha (up to a maximum 4.4 kg/ha per season)
- No impact on beneficial insects or IPM programs
- Rainfast within two hours of application
- Workers can re-enter the orchard once the spray has dried

More options to manage crop load

Brevis is a versatile new fruit thinner to help apple and pear growers optimise fruit set, yield and quality and to reduce biennial bearing. Biennial bearing is the production of a heavy crop one year followed by a light crop, and is a major problem for growers with a reduction in cumulative yield and fruit quality. The main cause of biennial bearing is competition between the current season's crop and production of next season's flower buds. Biennial bearing can occur as a result of adverse climatic conditions, susceptible cultivars, poor pollination and crop management practices, including how crop load is managed.

Flexible application

Brevis can be applied across a wider growth window (8–16 mm fruitlets), a wider temperature range (10–25°C) and up to two applications at a rate of 1.1 to 2.2 kg/ha (up to a maximum of 4.4 kg/ha per season). By comparison, 6-benzyladenine (6-BA) requires rising temperatures of at least 15°C for two or three days after application. The flexible application window for Brevis enables growers to vary the level of thinning according to their local climate and management.

Unique mode of action

Brevis contains the unique active ingredient, metamitron, which inhibits photosynthesis to induce fruit thinning. Applied as a foliar spray, metamitron is absorbed primarily by leaves but does not translocate throughout the tree. The rate of photosynthesis starts to decline within one hour of application and reaches its lowest point within three to five days of application. Excess fruitlets stop growing and discolouration of the pedicels can be observed five days after application. The weakest fruitlets within a cluster (i.e. fruitlets with low growth rates or without seeds) will usually drop first. Fruit drop will continue for several weeks. Depending on application rate, timing and environmental conditions, the rate of photosynthesis will return to normal levels within two to three weeks.



Cultivar responses

Brevis has been extensively tested on a wide range of apple and pear cultivars both locally and globally. While Brevis is able to induce thinning in most cultivars, the degree of thinning effect of Brevis can vary by cultivar. Please refer to the label at www.adama.com for a list of cultivars with a confirmed thinning response to Brevis in local and overseas field testing and/or commercial trials. For cultivar specific advice please contact your ADAMA Australia representative.

Impact on hand thinning

Hand thinning after natural fruit fall is both time-consuming and expensive. Brevis can significantly reduce the amount of hand thinning after natural fruit fall. However, the use of Brevis will not replace the need for hand thinning, particularly to remove damaged or misshaped fruit and to further optimise the number of fruit per cluster or tree. In certain situations (e.g. heavy fruit set, use in hard-to-thin varieties and/or adverse crop and weather conditions), further hand thinning may be required to achieve the desired fruit size and crop load.

Proven efficacy

Extensive field testing and commercial use conducted throughout Australia and overseas confirm that Brevis provides similar or better fruit thinning compared with existing products. Trials have shown Brevis has a beneficial impact on fruit size and quality by reducing fruit load and competition for nutrients when applied in accordance with the label directions.

Easy to use

Brevis is a water-soluble granule formulation that can be applied using existing orchard spray equipment, provided adequate coverage is achieved throughout the canopy. Brevis is rainfast within two hours of application and workers can re-enter the orchard once the spray has dried. Brevis has no withholding period when used according to the label directions. Brevis has no impact on beneficial insects and is compatible with IPM programs.

Unique technology from ADAMA

Brevis was developed by ADAMA, one of the world's leading crop protection companies. The fruit thinning properties of metamitron were first identified by researchers at the Fruit Research Station in Jork, Germany. ADAMA developed a formulation specifically for pome fruit thinning and continued development in collaboration with leading research institutes, advisors and growers throughout the world. Brevis – Latin for 'short', reflecting its short period of activity in apples – was launched in Europe in 2013. It is now registered for use in 23 countries throughout the world.



Australian efficacy data

Brevis has undergone years of field testing and development throughout Australia and globally prior to commercial release. Applied in accordance with the label guidelines, Brevis provides similar or better fruit thinning when compared with standard fruit thinners (Figures 1 and 2). In all apple trials in Figure 1, the initial Brevis application

was applied at 8–10 mm fruitlet size (refer Photo 1), whilst the subsequent application of Brevis (where applicable) was applied at 12–14 mm fruitlet size (refer Photo 2). Hand thinning was conducted at the normal timing. Pear trials were also conducted evaluating single and double applications at the same rate (Figure 2).

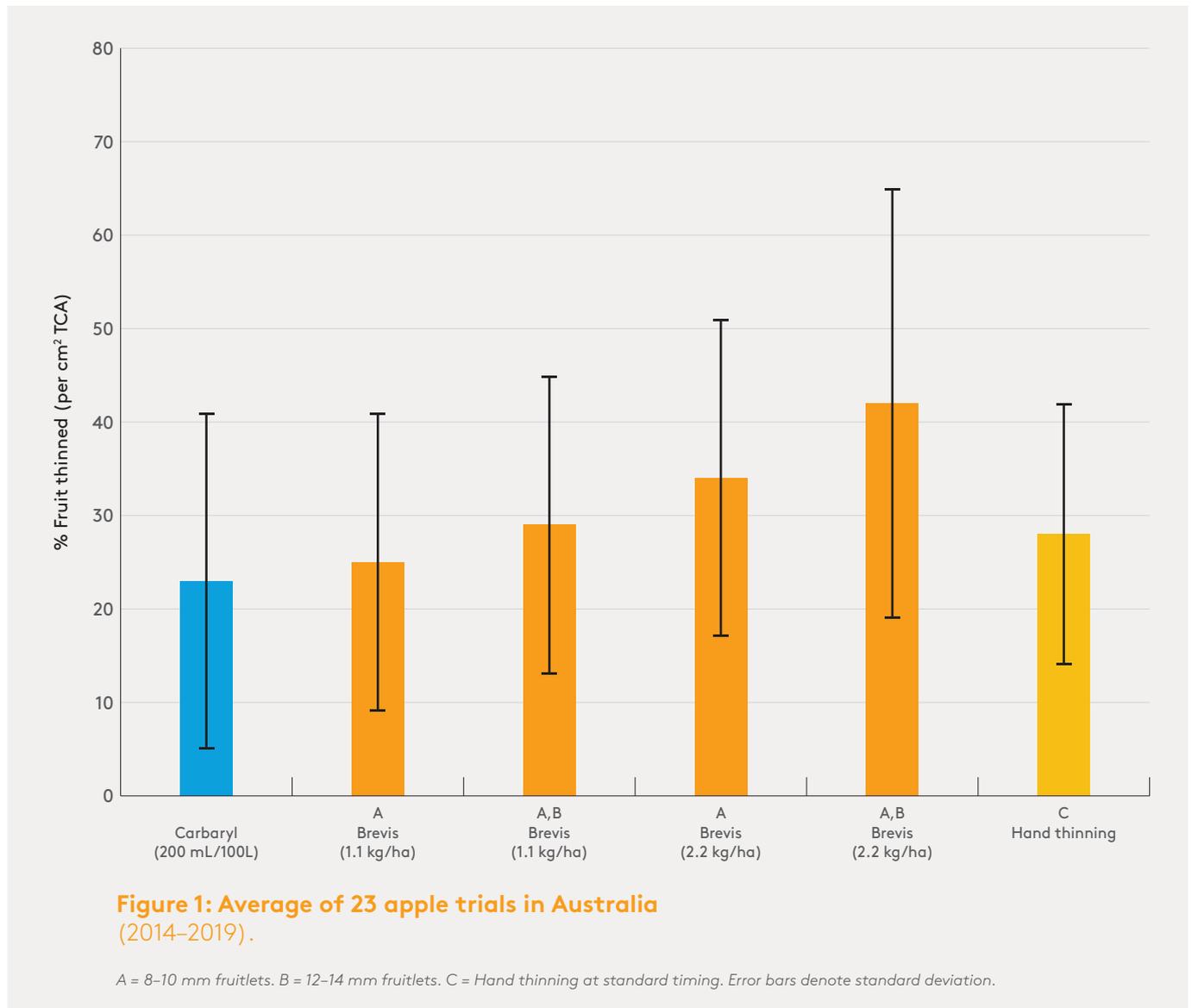
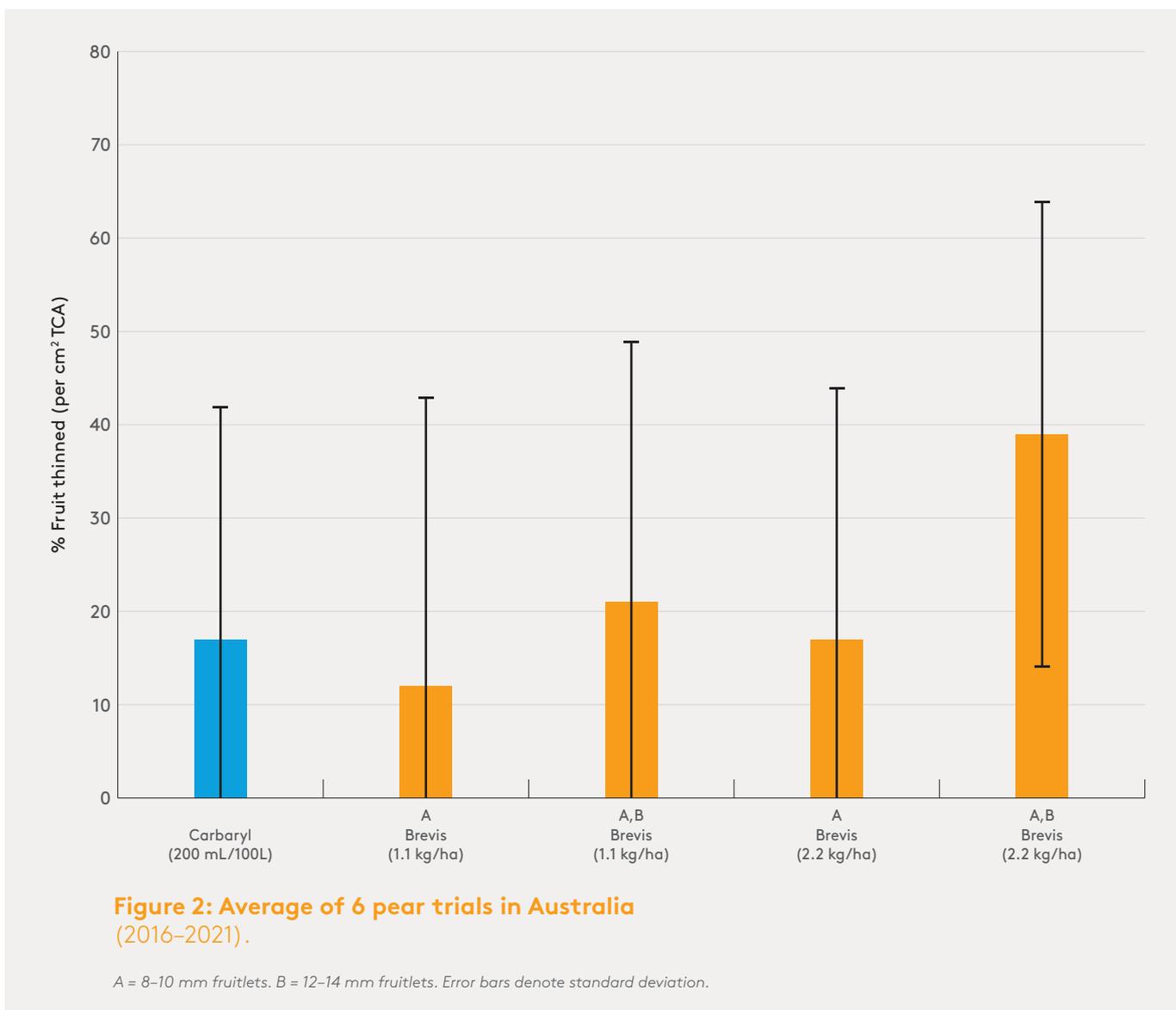




Photo 1: 8–10 mm diameter fruitlet (cv. Gala).



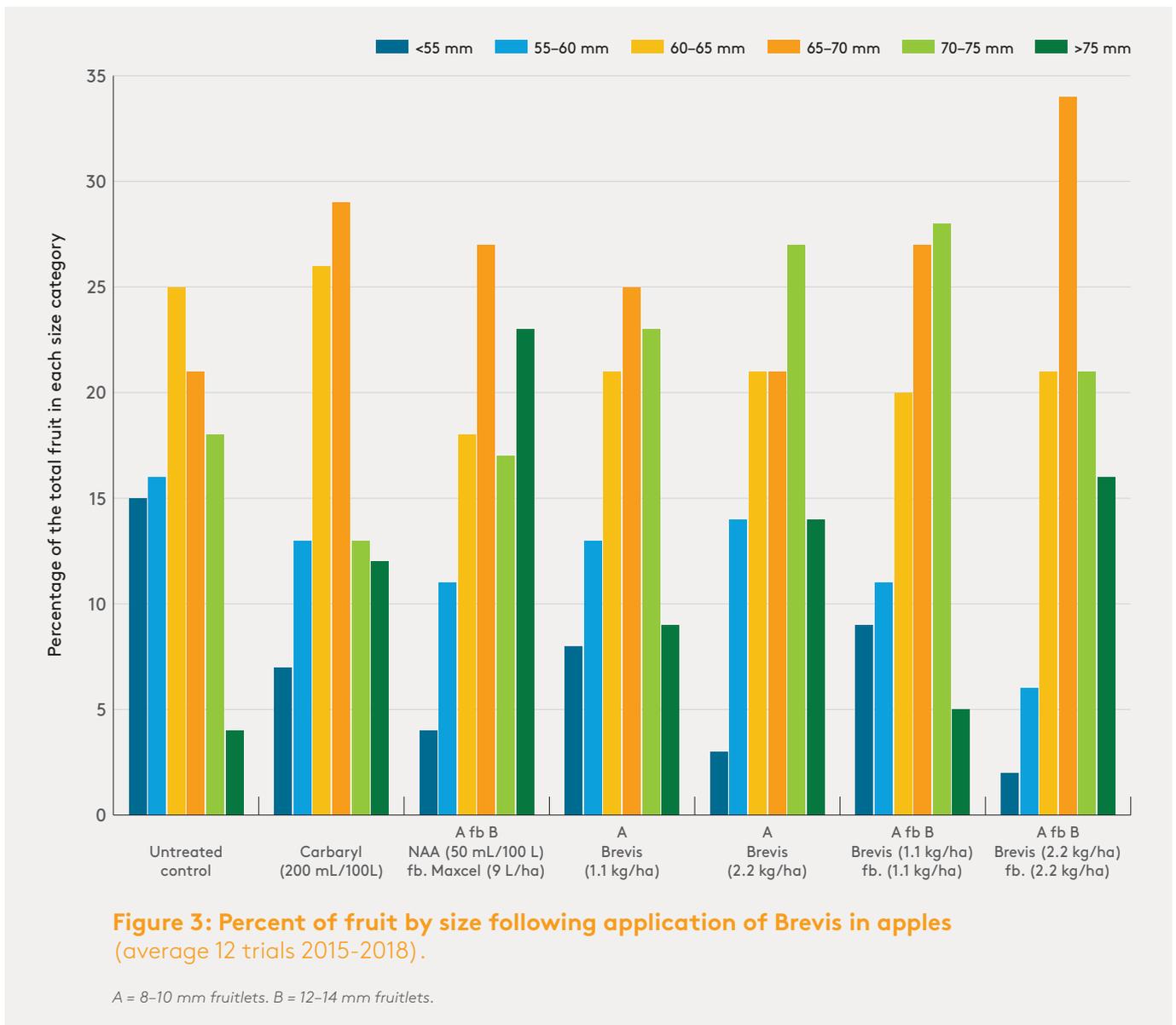
Photo 2: 12–14 mm diameter fruitlet (cv. Gala).



Fruit size and quality

Fruit thinning in apples and pears is critical as fruit size at harvest is directly related to the timing and degree of thinning. Ineffective or delayed thinning can result in lower grade of fruit quality and increase the risk of biennial bearing.

Applying Brevis within the recommended application window improves fruit size and quality. The relationship between application timing, thinning, fruit size and quality is demonstrated in Figures 3 and 4.



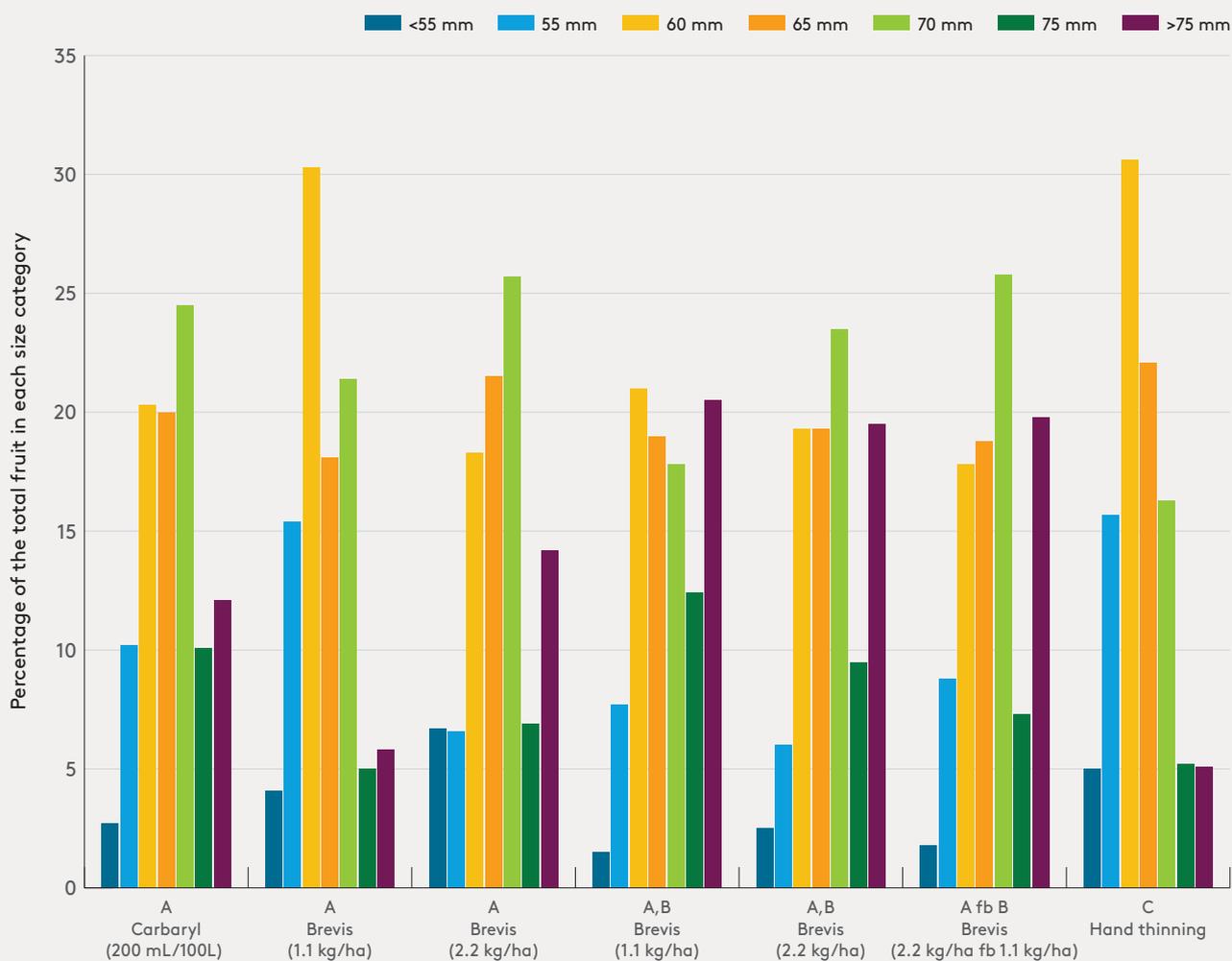


Figure 4: Percent of fruit by size following application of Brevis in pears cv. Packham (Shepparton East, Vic, 2018, Trial AD-AU-18-P08-1).

A = 8–10 mm fruitlets. B = 12–14 mm fruitlets. C = hand thinning at standard timing.

Application guidelines

Spray program

Apply Brevis at 1.1 to 2.2 kg/ha when conditions are suitable from the start of the use window. The rate used will depend on the amount of fruit thinning required. This will be influenced by fruit set and previous history of small fruit and biennial bearing.

Use the lower rate to thin fewer fruitlets, particularly on easy to thin cultivars and where strong thinning responses to Brevis have been previously observed.

Use the higher rate to increase thinning, where there is high fruit set, on harder to thin cultivars and/or when applying later in the Brevis application window. A second application of Brevis at 1.1 to 2.2 kg/ha may be required where there is high fruit set, particularly on harder to thin cultivars and where the photosynthesis rate is high and favouring greater fruitlet retention. There must be a minimum interval of 5 days between Brevis applications. DO NOT apply more than 4.4 kg/ha of Brevis per season.

Application timing

Application timing is critical to optimise efficacy. Brevis should be applied when the central (king) fruitlets are 8–16 mm in diameter. When applying Brevis as either a single timing or split application, DO NOT apply later than the 16 mm diameter stage.

Application conditions

The efficacy of Brevis is directly related to day/night temperatures before and after application. Apply when daily temperatures are between 10°C and 25°C. Always check current and forecast weather conditions before application. Cloudy weather (lower light intensity) and warmer night temperatures >10°C the week before and after application can increase the thinning effect of Brevis.

Postpone application if temperatures are outside the recommended range or trees are under stress due to cloud cover, heat, frost, drought or hail damage. Consider reducing the application rate and/or the need for a second application.

DO NOT apply within five days of a frost or if frost is expected. DO NOT apply to wet foliage, e.g. early in the morning after a dew or shortly after rain.

BreviSmart® decision support tool

Following collaboration with leading pome fruit institutes in Europe, ADAMA has developed **BreviSmart®**, a model that can be utilised to help predict the timing suitability of a proposed thinning application, based on orchard location, variety and fruitlet size, recent temperatures and imminent forecasts. More information on how to access the BreviSmart decision support tool can be obtained from contacting your ADAMA representative.

Spray application

Apply in a spray volume to achieve good coverage. DO NOT apply past the point of run-off. Brevis has a thinning effect only on the treated parts of the trees and should only be applied to the parts of the crop canopy that require thinning. Application should be made using appropriate spray equipment and sufficient water to provide adequate penetration and coverage. Equipment setting and water volume may need to vary, depending on the tree height and canopy. Take care not to overlap sprays during application. DO NOT apply oil-based products within 7 days before or after application of Brevis. Table 1 converts the recommended application rate (kg/ha) to an application rate per 100 L for a range of target spray volumes.

Table 1: Application rate vs. spray volume.

Application rate (kg/ha)	Water volume (L/ha)	Rate (g/100 L)
1.1	1000	110
	1500	73
	2000	55
2.2	1000	220
	1500	147
	2000	110

Use with other fruit thinners

Brevis can be applied as part of program in a sequence with other thinners. If applying primary thinners, assess the effectiveness of these applications and additional fruit thinning requirements before deciding on the application rate/number of Brevis applications. ADAMA Australia does not recommend tank-mixing Brevis with other fruit thinners.

Use with other products

Brevis should not be mixed with any other product, including wetting agents, surfactants and foliar fertilisers. The addition of a tank mix partner may have an unpredictable effect on thinning response and an increase in leaf phytotoxicity.

M9 rootstock

Overseas data suggests M9 rootstock may be more responsive to thinning. No local trial data results are available to confirm. Apply Brevis to cultivars/varieties on a small scale to confirm response prior to application on a commercial scale.

Application method

Apply using ground equipment. DO NOT apply by aircraft. Brevis has a thinning effect only on the treated parts of the trees and should only be applied to the parts of the crop canopy that require thinning. DO NOT allow spray drift onto non-target crops, especially stone fruit.

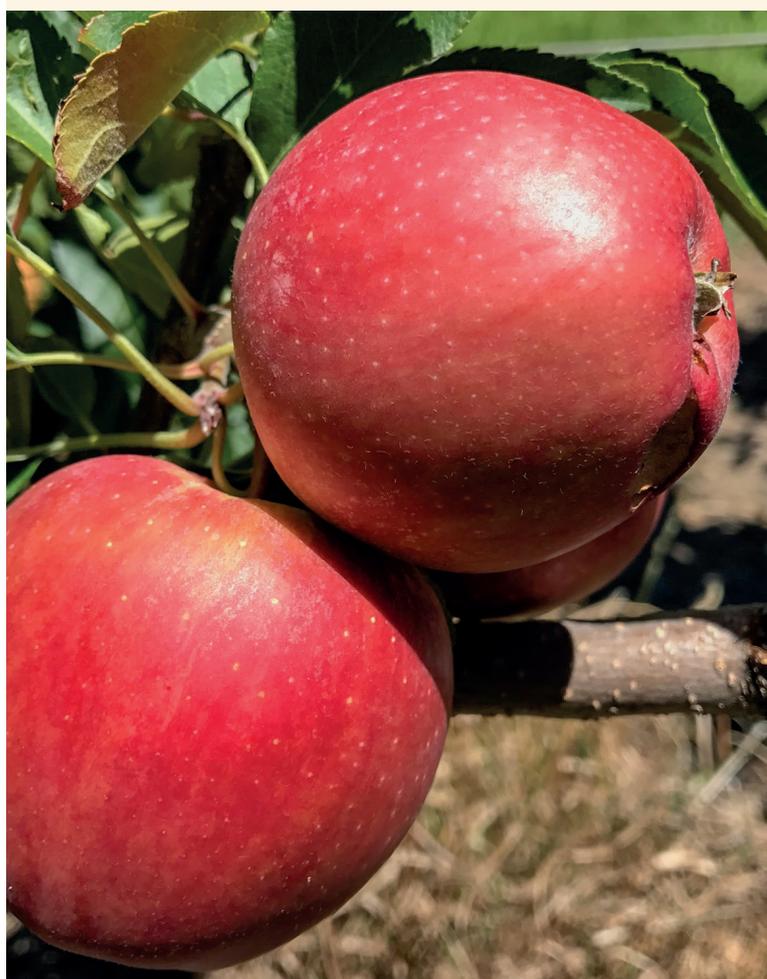
Withholding periods

Harvest: Not required when used as directed.

Grazing: DO NOT allow livestock to graze interrows in treated orchards.

Application checklist

- ✓ Apply to 8–16 mm diameter central fruitlets
- ✓ Apply when daily temperatures are 10°C to 25°C
- ✓ Apply up to 2.2 kg/ha per application, with up to two applications (maximum 4.4 kg/ha per season)
- ✓ Apply in a spray volume to achieve good coverage
- ✓ DO NOT tank-mix with other crop protection products, wetting agents, surfactants or foliar fertilisers
- ✓ DO NOT apply past the point of run-off
- ✓ Brevis is rapidly absorbed and is rainfast within two hours of application
- ✓ Orchard workers can re-enter the orchard once the spray has dried



Crop load management

Determine the level of thinning

Desired fruit size, target yield, pruning levels and initial blossom density and strength are some of the key factors that determine the degree of thinning required. Calculating the desired crop load is the first step in determining the required level of thinning.

The level of thinning provided by Brevis can vary significantly according to the application rate and timing. Determining the optimum application rate and timing depends on the target crop load and a range of orchard parameters, including cultivar, tree age, training system, rootstock and tree vigour/stress.

Growers and advisors should also base thinning decisions on the historical behaviour of cultivars on their property and weather conditions leading up to and following application. If the block history is unknown or there is a history of variable responses to fruit thinners, evaluate Brevis on a small trial section within each block for one or two years before commercially treating whole blocks.



Factors that increase thinning

The thinning effect of Brevis is influenced by a number of factors that determine the rate of photosynthesis in treated trees. These factors need to be considered when deciding the appropriate application rate, number of applications and application timing. Refer to Table 2.

Factors that decrease thinning

Conversely, a range of factors may decrease the thinning effect produced by Brevis:

- Low application rate and/or single application
- Low night temperatures
- Application to large fruitlets (>16 mm diameter)
- Use in hard-to-thin varieties (e.g. Fuji)

Cultivar differences

The thinning program needs to be adapted to the cultivar to avoid economic loss by over-thinning or under-thinning. Thinning classification of common cultivars may vary between apple growing regions.

Crop safety

Brevis can cause minor chlorotic/necrotic areas on leaves and minor leaf drop. These effects may become visible on treated foliage 10 to 14 days after application. These effects have no impact on crop development or fruit yield or quality. The incidence of leaf phytotoxicity is related to the application rate, weather conditions and variety. Refer to the Brevis product label for further details on apple and pear varieties.



Table 2. Factors increasing the activity/thinning effect of Brevis.

Parameter	Comments
<p>Application of:</p> <ul style="list-style-type: none"> Oil based products such as summer oils, adjuvants and crop protection products that contain oils (e.g. penthiopyrad) Other fruit thinners, applied either before/after or in a tank mix with Brevis. 	<p>For oil-based products, maintain an interval of at least 7 days before or after application of Brevis.</p> <p>For other fruit thinners, refer to the general instructions on the registered label.</p>
<p>Climatic effects including:</p> <ul style="list-style-type: none"> Warm night-time temperatures (>10°C) the week prior to and post application. High humidity at the time of application. Reduction in sunlight/light intensity (e.g. cloud cover or overcast conditions, hail nets, etc.). The use of hail nets may increase the effectiveness of Brevis due to reductions in solar radiation and the existence of a microclimate. 	<p>Application should be postponed if trees are under stress e.g. after a period of cloudy weather, high day and/or unusually high night temperatures, drought, hail damage or when a stressful period is expected. If conditions favour over-thinning, postpone application or decrease the application rate and/or reconsider the need for a second application.</p>
<p>Orchard management:</p> <p>Cultivars and clones respond differently to fruit thinning agents. Not all cultivars/clones have been tested for crop safety under all environmental conditions and growing circumstances. In addition to seasonal weather conditions occurring prior to and after flowering, other factors can play an important role in the response to chemical thinning agents including:</p> <ul style="list-style-type: none"> Tree age Training systems Rootstock Tree vigour Stress on trees Orchard cropping history/orchard management practices Other thinning sprays/plant growth regulators applied to the block <p>In orchards with vigorous growth, the activity of Brevis may be increased due to competition for photosynthates between the vegetation itself and the fruits. Strong and vigorous trees generally respond more to chemical fruit thinning.</p>	<p>DO NOT use on areas with a history of poor or variable fruit set or poor fruit retention or on trees with poor tree health/under stress e.g. frost damage, water stress, heat stress.</p> <p>DO NOT apply higher rates on varieties or trees with a history of issues with poor fruit retention or over-thinning responses to other thinning products.</p> <p>Use of Brevis on young apple/pear orchards under 4 years is not recommended.</p> <p>Caution must be exercised when using the product for the first time or on new areas or blocks, to avoid over-thinning the crop. If the block history is unknown or there is a history of variable responses to fruit thinners, evaluate Brevis before commercially treating whole blocks by applying only to a small trial section within each block for 1–2 years.</p>
<p>Growing region:</p> <p>Differences in thinning responses to Brevis have been observed between growing regions.</p> <p>In the Stanthorpe growing region of Southern Queensland, very strong thinning effects (i.e. more fruitlets thinned than standard chemical fruit thinning/hand thinning practices) have occurred over multiple trials and seasons, especially for the higher rate applied at 8–12 mm growth stage.</p> <p>In southern growing regions (i.e. the Goulburn Valley and Yarra Valley regions of Victoria, Adelaide Hills, Southern New South Wales and Tasmania), very strong thinning responses from Brevis (as defined above) have been less frequent in field testing. This is most likely due to the interaction of factors impacting the thinning effect of Brevis.</p>	<p>DO NOT apply high rates and multiple applications of Brevis in regions or situations where poor or variable fruit set has occurred, and strong thinning responses are expected.</p> <p>The decision on rates and number of applications should be made at the start of the application window for Brevis, after the effect of any primary thinner applications.</p>



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