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Editor
Nick Morenos
B Ag Sc, Grad Dip Ed
Ph 0417 145 452

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Ph 0417 145 452
ftm@fruittreemedia.com.au

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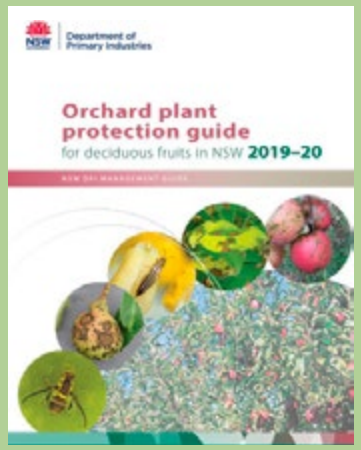


Managing disease, pests & disorders

This information is from the *Orchard plant protection guide for deciduous fruits in NSW 2019–20*, published by the NSW Department of Primary Industries.

It is reproduced here with permission and thanks. The guide is available here

NOTE: *Any chemical recommendations are based on chemicals and products registered for use in New South Wales, Australia. Readers from other jurisdictions should check product registration status and label recommendations for their country, state or territory.*

Irregularity in cropping is a major economic constraint in many fruit tree orchards. Understanding the mechanisms involved in flowering and fruit set can help orchardists to manage crop loads, resulting in improved yields, fruit quality and returns.

Continued from last issue

Blossom thinners

Ammonium thiosulfate (ATS): ATS works by desiccating or burning the style and stigma of the flower, thus preventing pollination and fertilisation. While leaf damage does occur with desiccants, the degree of damage that occurs when using the recommended rates does not affect fruit development, size or quality. It should also be noted that the degree of desiccation can be influenced by temperature, with higher temperatures resulting in greater desiccation.

Application timing is critical to achieve a satisfactory level of thinning. The chemical must be applied when sufficient flowers have already been fertilised to give a good crop load—in apples this can be as early as 20% bloom.

Multiple applications are recommended—the aim is to remove the later-opening flowers. In cultivars with an extended flowering period, such as Gala, three applications might be necessary.

Armothin: Desiccant. Useful for cultivars that have an extended flowering period.

Ethephon: Ethephon can be a vigorous thinner, completely removing weak spurs or depleting fruit positioned low on the tree.

Complete fruit removal: ethephon can be used at 40–50 days after full bloom (dAFB) to remove damaged crops, e.g. by hail. This not only saves removing the crop by hand but has a positive effect on return bloom.

Naphthalene acetic acid (NAA): While NAA can thin most cultivars between full bloom (FB) and 21 dAFB, the earlier it is applied the better the response in fruit size.

NAA promotes vegetative growth—advantageous in green apples such as Golden Delicious or Granny Smith, but a disadvantage in red apples where extra vegetative growth shades fruit, inhibiting red colour production.

NAA interacts with plant bioregulators containing the gibberellins GA_{4+7}. Hence it is not compatible with formulations such as Cytolin® when applied at the normal recommended rate.

However, if the rate of NAA is reduced to 3–4 ppm, then a Cytolin/NAA program works well.

Lime sulfur: Desiccant, suitable for organic orchards.

Managing crop load in deciduous trees (part 4)

Dr Sally Bound, Senior Research Fellow,
Tasmanian Institute of Agriculture, University of Tasmania

Managing crop load in deciduous trees

Post-bloom thinners

6-benzyladenine (BA): BA works most effectively following treatment at flowering with one of the blossom thinners ATS, ethephon or NAA.

It is temperature dependent: the warmer the temperature the more effective it will be.

BA is suitable for IPM programs as it is not persistent or toxic. It can also increase fruit size independently of the thinning effect and might increase fruit firmness.

Carbaryl: Carbaryl is regarded as a mild thinner and usually only removes the slower growing fruit within bunches.

Carbaryl is temperature dependent, requiring warm dry conditions for effective thinning. The warmer the temperature the greater the thinning effect.

It can also be used on trees where using a primary thinner is not warranted, either because the trees are young or because of sparse blossom buds.

Metamitron: Metamitron acts by temporarily inhibiting photosynthesis, targeting the weakest fruit within a cluster.

It is rainfast within two hours, is non-persistent and has no effect on beneficials. The thinning effect is dependent on radiation with a stronger effect under reduced light (cloudy or under netting).

Thiram: a protectant fungicide that has a slight thinning effect when applied after petal fall, but its effect is mild and can be unreliable.

Thiram improves the efficacy of carbaryl when tank mixed.

Chemical thinning

All chemical thinners have some disadvantages (Table 1) however, despite these limitations, a chemical thinning program produces markedly superior results to hand thinning, both economically and in terms of tree physiology.

The most effective chemical thinning programs combine blossom and post-bloom thinners. A sequential spray program allows lower chemical quantities to be used at each timing, thus reducing the risk of over thinning. If the chemical thinners have been effective, then all that should be required is a subsequent light hand thin to remove damaged fruit or break up any remaining bunches.

Benefits of chemical thinning

To achieve good thinning and fruit quality, all chemical thinners need to be applied at the appropriate physiological stage and under the climatic conditions best suited to each chemical.

Choice of thinning chemical is important, as some cultivars do not respond well to some chemicals.

Managing crop load in deciduous trees

Netted orchards

Fruit set in trees under hail netting tends to be lower than uncovered trees.

Due to the lower light levels, chemically thinning netted trees often induces greater fruitlet drop, hence care should be taken to avoid over thinning.

continued next month

Chemical	Concentration	Time of application	Disadvantages
Armothin	2 L/100 L water	90–100% bloom	Can be phytotoxic to leaves
Ammonium thiosulfate (ATS)	0.75–1.5% v/v	20% and 80% bloom (apple) 80–100% bloom (plum, peach)	Can cause russet Timing critical
Benzyladenine (BA)	150 ppm applied as a fine mist (9 L/ha in 1,200 L/ha)	Fuji and Gala 15–22 dAFB* Red Delicious 10–20 dAFB Golden Delicious 10–20 dAFB	Temperature dependent: needs >15C and rising temperature for 2–3 days after application
Carbaryl	Recommended label rate	14–60 dAFB Repeat at 7–10 day intervals as required	Requires warm dry conditions Toxic to bees, beneficial invertebrates and mammals Can cause russet Can reduce seed number Banned from some export markets
Ethephon	30–50 ppm for younger trees 100–150 ppm for mature trees	Balloon blossom to 7 dAFB	Tendency to flatten fruit Higher rates can depress fruit size Not effective at cooler temperatures
Gibberellic acid (GA)	70–400 mL/100 L water, minimum spray volume 1,000 L/ha	Flower bud initiation stage	Applied previous season May delay harvest
Lime sulfur	2% solution, applied to runoff	20% and 80% bloom	Can cause russet
Metamitron	1.1–2.2 kg/ha	8–16 mm fruitlet diameter	Can cause minor leaf phytotoxicity Thinning effect dependent on radiation
Naphthalene acetic acid (NAA)	4–5 ppm for easy to thin cultivars up to 12 ppm for difficult to thin cultivars	FB to 5 dAFB 2 sequential sprays may be required, the first applied at FB and the second 3–5 dAFB	Can depress fruit size Can reduce seed number Pygmy fruit if applied after 10 dAFB Interacts with Cytolin Can cause russet Rewetting causes over-thinning
Thiram	Recommended label rate	As for carbaryl	N/A

Table 1. Available chemical thinning agents and recommended concentrations and application times.
*dAFB = days after full bloom.

Multi-leader, two-dimensional (2D) fruiting walls are becoming popular with growers as an intensive production system.

This is especially true when a vigorous rootstock can be used at a moderate tree density, and where trees have a simple structure that is efficient and labour friendly.

This article deals with the development of the tree's structure, and setting it up for a long productive life.

Continued from last issue

Fruiting units

The fruiting units are allowed to develop from the base up of each leader.

These start as short laterals and spurs. A spur is a contracted lateral.

Spurs must maintain a terminal vegetative bud that can make leaves and extend the spur the next season.

Full canopies are made up of numerous low vigour fruiting units and spurs that allow transient dappled light to penetrate through the canopy, providing a good environment for renewing the bearing wood and optimum production of fruit of good size, colour and taste.

Bearing-wood management

An understanding of the fruiting habit is essential to maintain good quality bearing wood.

Buds at the basal end of a fruiting unit typically become flower buds. Apricots do not have mixed buds.

2D fruiting wall for apricots (part 3)

Bas van den Ende and Mick Conti*

*Mick Conti is a fruit grower in Ardmona, Victoria.

2D fruiting wall for apricots

Strong sylleptic shoots with wide angles have been stubbed in late summer to create fruiting units. The guide strings and plastic ties are used to keep the leaders growing uninterrupted and in position.

After two years, uniformity of the leaders is as good as can be expected. The leaders have not been headed. This will be done in the third leaf after harvest.

After flowering or fruiting, no vegetative buds are left to form leaves and shoots to create new fruiting positions, and the fruiting unit quickly becomes bare. This is called natural floral bud extinction, and to minimize this problem, you need to do these things:

- Maintain a hierarchic growth habit, where the extension growth of the leader is kept dominant initially. When the canopy is fully developed, the tops are pruned soon after harvest at the maximum permissible height (80 per cent of row width).
- During summer, encourage growth of new semi-weak laterals. These will form the next new fruiting units. You also need to stub-cut strong shoots which have an angle of no less than 45 degrees. Remove any strong upright shoots—these will never form good fruiting units.

2D fruiting wall for apricots

Typical fruiting units, some of which show natural floral bud extinction at their basal ends.

Fruiting units need leaves and vegetative buds to remain productive because apricots have simple flowers and suffer from natural floral bud extinction.

- Fertigate twice a month and keep chewing insects away, especially from the growing leader tips. Leaders can grow more than one inch a night.
- In autumn, a rigorous renewal of bearing wood is necessary by cutting back into the fruiting wood to stimulate vegetative growth the following season. New growth will form from the rudimentary buds on the piece that is left and also nearby leader.

When the tree canopy is fully developed, usually within three years, impose a post-harvest water stress strategy.

Use regulated deficit irrigation (RDI) after harvest during summer to control vegetative growth and keep the leaders calm.

As well, with good management of sunlight, you can maintain fruiting units that last longer and ensure regular production and consistent fruit quality via controlled vigour in the bearing wood.

All about CHERRIES

For information and professional advice,
contact Ken mobile 0400 652 258
e-mail k.gaudion@bigpond.com

Act now to avoid over-cropping cherries this season

There has been a great effort by Cherry Growers Australia in recent weeks to focus growers to adequately prune for improved quality, to fine-tune nutrition for improved quality, and to assist with the management and timing of application of growth regulators for increased firmness and quality.

However, there might be some varieties or even some blocks that defy the odds, and as the fruit grows and shedding has occurred, may still have trees that are over-cropped.

Good chilling and recent rains point toward a fairly normal growing season for cherries in Australia.

The risk is, should the crop be much greater than average, then any small or poorer quality fruit may not find a home—or at least one that generates a profit for the grower.

This coming season in particular because of so many unknowns in regards to availability of labour, restricted movement of freight (particularly by air), the ability of business in hospitality to restart when the COVID-19 restrictions are lifted, brings some uncertainties into the mix for the sale of fresh cherries in comparison with previous years.

How to avoid overcropping

If there seems to be an excess of cherries on the trees after fruit shed, here are a few options to reduce the amount of small fruit during harvest:

- Remove handfuls of cherries from shoots that should have been removed when pruning and have now set too much blossom. This provides space for the remaining cherries to grow to a marketable size (see Figure 1).

Act now to avoid over-cropping cherries this season

Figure 1. Avoid over-cropping: remove handfuls of cherries or prune branches that have too many fruit.

- Alternatively, shorten the growth by pruning off the wood with leaves and fruit (see Figure 1).
- If a long tube of fruit is hanging almost horizontally, a serrated-edge knife is useful to slash the underside of the branch and slice-off half the cherry stems, leaving the remaining fruit with more room to grow. Doing this is better than growing small square cherries where pickers find it hard to pick because there is no room to get their fingers in to begin picking.

The other problem with a tube of fruit is that leaf growth becomes stunted—that compromises the fruit to leaf ratio and results in a lack of calcium in the cherry. Less calcium means softer fruit.

Be alert and act now

So be alert when looking at your trees and when driving or walking through the rows.

Note where action could be taken to improve the quality of your cherry crop.

By doing that, you will also be improving your bottom line.

Bigger, cleaner fruit, more dollars with unique fungicide


Joe Giblett

Veteran fruit grower Joe Giblett well knows the threat insects and diseases pose to successful orchard production.

Born and bred at Bridgetown in Western Australia's South West and having been by his father's side in the family orchard since he was a nipper, today Joe manages the Red Moon orchard on the outskirts of Donnybrook for Casotti Enterprises.

The Casotti family's Karragullen Cool Stores is one of the largest growing, packing and wholesaling operations in the state for pome and stone fruit. The family's other orchards in the South West include Casuarina Valley and Ladycroft near Manjimup, as well as Blue Moon and Eastwind near Donnybrook.

Joe said black spot (or pear scab) and brown rot with the nectarines were some of the main diseases.

"The problem with black spot in pears is it can be a total wipe-out of the crop," Joe said.

"If you didn't spray, you would hardly pick a pear. With brown rot in the stone fruit, it can be a 50% write-off for the crop too."

Red Moon grows Packham, Bartlett and Corel pears and Red Bright, Bright Pearl, August Bright and September Bright nectarines over 30 hectares, as well as table grapes.

The family's fruit sells to major supermarket chains across Australia and to local markets.

Joe said the diseases, as well as insects, required vigilant monitoring on a daily basis.

He said before flowering and during flowering was a critical time in the stone fruit, while control of black spot in the pears was ongoing.

Unique, dual mode of action

In recent years, together with the help of John Campbell from Donnybrook Farm Service, Joe has added the unique, dual mode of action fungicide, Luna® Sensation, to his spray program against disease.

Developed by Bayer, Luna Sensation combines the active ingredient fluopyram, a novel chemical within the SDHI family, with trifloxystrobin, providing another fungicide option for growers and aiding disease resistance management.

It controls blossom blight, shot hole and brown rot in stone fruit; black spot, powdery mildew and suppresses alternaria leaf blotch in apples; black spot in pears; and blossom blight, stone fruit rust, shot hole and suppresses hull rot in almonds.

John said most alternative fungicides only contained one chemical group, so the combination of two active ingredients provided wider disease control.

"There is nothing on the market that compares to Luna Sensation with its two chemical groups," said John, who has been working with Donnybrook Farm Service for 13 years and previously as a grower in the area for 20 years.

Joe said on the nectarines he applied the fungicide at 10% flowering to control blossom blight and again at least a day before picking to combat brown rot. It is applied at 40 mL/100 L for the blossom blight and 30 mL/100 L for the brown rot through their Silvan air blast sprayer travelling at 5 km/h to ensure good coverage.

John said it was imperative to keep crops clean in the blossom blight period, as disease could set trees back and damaged fruit was unmarketable.

Application

Joe said on the pears, Luna Sensation was applied twice, seven to 10 days apart, from the green tip stage at 30 mL/100 L, using enough water to provide good coverage to target black spot.

"We do have some big old trees, so you need to have the water volume up."

He said the one day withholding period with the fungicide before harvesting stone fruit was a bonus, the low application rate made it easy to use, and it delivered better results.

"It's easy to use, easy to mix and it works. A lot of people are using Luna Sensation around here now."

"Luna Sensation does blossom blight and brown rot in the one spray, and one bottle will do all the orchard once, whereas with other products we will have to get half-a-dozen 20 L drums.

"It's easier to use because you're only putting 600 mL in a vat rather than pouring in 20 L, and it means less disposal and that's better for the environment."

John said the one day withholding period in stone fruit was a huge benefit for fruit marketing if rain was received just before harvest.

The withholding period in pome fruit is longer at 14 days, but this helps to control late disease outbreaks in the last two weeks prior to picking.

Fruit quality

Joe said since using the fungicide, he had not noticed any brown rot in the nectarines.

"Before we used Luna Sensation, we were getting odd outbreaks of brown rot, but since using it we haven't at all."

"The fruit has been clean and we have sold all fruit that has gone in the bin. We are getting bigger fruit, cleaner fruit, and that puts more dollars in the pocket at the end.

"We are still working on the pears. We have an area of pear scab (black spot), but the results are better than the previous two years. We are starting to get on top of it and I think a lot of that is due to Luna Sensation."

John said where growers throughout the wider region had used the fungicide, final fruit quality had been excellent.

"It has been around for three years and growers have been comfortable using it and have had minimal outbreak of disease. It has become one of the first choices because since using it, brown rot and blossom blight has not been an issue and we've hardly seen any alternaria in the area in the last three years—and that's a direct result of using Luna Sensation.

"We are fortunate (in this area) that we don't have a lot of summer rainfall to exacerbate disease, but with Luna Sensation in the arsenal it's been sensational."

Joe said it had certainly become a key part of the fungicide program at Red Moon for the future.

"Luna Sensation is essential to this operation now because the proof is in the pudding—why would we change."

Resistance management

Joe encouraged growers to help ensure the longevity of the fungicide's unique chemistry for the future.

"New chemistry is extremely important and we have to follow the label exactly or we are going to ruin the chemistry. That's why we use it properly—so we can still use it in 10 years time."

John said mixing up the chemical groups used through the middle part of the season was critical to help prevent resistance.

Contact: Lachlan Bird
P: 0407 885 209
E: lachlan.bird@bayer.com
www.crop.bayer.com.au

Cost effective protective solutions from Polygro

Polygro are coming up to 20 years offering turn-key solutions with crop protection products into the horticultural sector.

James Downey, National Sales Manager for Polygro® provides an overview of what Polygro can offer your business to deliver high-quality and safe food production.

"We offer the latest innovative and cost effective protective solutions for your growing needs," James said.

"We supply products via the rural re-seller sector, netting contractors and installers from our national warehousing."

Typical relevant horticultural netting solutions include:

HailStop® quad hail netting & static hail net

Manufactured via the latest technology utilising BASF UV inhibitors and virgin USA polymers.

"Our little secret is that all our nets go through a manufacturing process so they have a memory in them—so during and after a storm you have the best opportunity to have your net spring back into action when the hail has melted and the wind has abated," James said.

"I have seen many inferior nets over the years hang on the ground after a storm and cannot be re-tensioned; so have peace of mind, ours do not do that. We also manufacture to suit your requirements."

GrapeDrape® over-row netting

This netting is perfect for protecting cherries from bird attack.

"We are the major supplier of over-row netting in Australia," James said. GrapeDrape offers:

- Unique hexagon pattern
- 30gsm
- 15mm hole size
- Full range from 6m up to 25m width in black or white.

"Our nets are uniquely made with our memory process. They are so good we have growers using them as permanent structure netting. We also manufacture to suit your requirements."

BirdStop® commercial structural bird netting

"Our structural bird nets also have the unique memory process during manufacturing."

"I have growers ring to say they are amazed that their bird net survived a major hail storm and is still like new, plus it saved their crop."

The range extends from 15mm and 20mm hexagonal hole size in both 45gm and 52gm weight options. Net is manufactured to suit customer requirements.

— New Product —

Polygro HailStop BeeStop over-row netting

"Well it's not that 'new', as we have been supplying this unique product to one of Australia's largest citrus growers for a number of years," James said.

"Our manufacturer is also the number-one supplier of bee exclusion net into the USA—no cross pollination or hail damage over there!

"Everyone, get out your Net Wizz and Tatura machines this season, as we are now offering our product to all of the industry.

"We want you to have a product that is not only cost effective, it also incorporates our unique memory process and it includes high UV additives."

James said that for hail storms you can't beat a permanent structure (which Polygro also supply), but having the same memory process in your net gives you less stretch and it gives the net a better opportunity to defend against hail before it gets to your prized fruit.

Longevity

Polygro understand the harsh Australian UV conditions and offer 2000 KLY of UV protection with their net.

"To put this in perspective, some nets on the market are being supplied at only 650 KLY," James said.

"Look after your net and you should expect 15 years UV life when only required to be applied for a few months each year.

"Our factory provides an 8-year pro rata UV warranty if you want to leave it out 24/7!"

Shade factor

James said at a 14–15% shade factor, white net gives you the best protection from sunburn while maximising light for plant growth.

"The light that penetrates the white net bounces off trees and back onto the white net then back onto plants continuously, giving plants the maximum amount of light to grow."

"Have you ever wondered why you can see through black, green and transparent nets but can't see through white net? Well, white reflective light is the answer!

"I have asked growers around Australia and USA why they use transparent nets. Ninety-nine per cent of respondents said they have always used them and didn't realise it made a difference. The other one per cent weren't sure why."

polygro®
we'll grow with you

Length, width & delivery of Polygro HailStop BeeStop

Polygro offer widths of 6m, 7.5m and 10m, in 100m lengths, with a standard weight of 60gsm.

"Apart from our stock lines, we can manufacture to your requirements in any width or colour. Allow 8–9 weeks for delivery."

Price Promotion

"We would like you to experience the benefits of our Polygro HailStop BeeStop net this season, and are offering a *Best possible price* promotion", James said.

"Provide a genuine alternative quote and we will beat it by 5% minimum."

For the full range of products visit
www.polygro.com.au
For technical and sales information
contact James Downey
phone: 0400 893 250
email: jdowney@polygro.com.au

Polygro is part of the Australian-owned Tapex Group of Companies.

They have you covered when it comes to the agriculture, horticulture and landscaping industry in Australia. The following group of companies offer unsurpassed quality, service and price:

Tapex Industrial—twines, lashings.
Polyfabrics Australasia—landscaping and geo synthetics
Dig Safe—Safety markers, above & below ground products
Green Life Structures—netting, shade cloth & greenhouse supplies and installers
Polygro®—Supplier of crop protection products into the Australian horticulture and fruit grower industry.

Wetout® — a superior, new generation non-ionic surfactant

After extensive research, SST has developed a new generation non-ionic surfactant that may soon become the new standard across Australia and New Zealand

Wetout® is a unique proprietary formulation of vegetable based surfactants that improves efficacy in every aspect while reducing unwanted negatives such as spray drift.

Benefits of Wetout

- **Superior spreading**—better coverage
- **Better deposition**—more product on the target
- **Less drift**—less loss and better compliance
- **Increased efficacy**—fewer weeds
- **Increased versatility**—fewer products needed
- **Low user rates**—less handling and storage, very cost effective
- **Environmentally friendly**—biodegradable

Spreading

Wetout reaches levels of spreading that were previously only possible by using very expensive organosilicones.

When it comes to spreading, Wetout can truly be considered so advanced that it is not even in the same league as conventional non-ionic surfactants.

Despite spreading thin, Wetout retains a long drying and humectancy period, which is important for uptake of glyphosate products.

Better deposition

To achieve the best deposition, a surfactant needs to quickly travel to the surface of the droplet—the time it takes from leaving the nozzle tip to hitting the target.

Wetout is fast and therefore achieves excellent adhesion to the surface when it hits the target. As a result, bounce and splashing-off are greatly reduced—so more product stays on the target.

Less drift

Drift is an important topic in modern spray applications. It does not only have environmental impacts, it also means loss of product, efficacy and money.

While the old benchmark non-ionic surfactants increase drift dramatically, the unique blend of Wetout does NOT. It reduces drift at around the same level as a well-known lecithin or oil that contains drift-reduction adjuvants.

Independent trials show that Wetout improves the spray pattern of an *extremely coarse* spray using Turbodrop XL-D 02 at 100L/ha, 3.2 bar. The addition of Wetout almost tripled the number of droplets to 78 droplets/cm^2 compared to 28 droplets/cm^2 when water was used.

Increased efficacy and versatility

The proprietary formulation of surfactants in Wetout are more versatile than a single surfactant formulation that is often found in older non-ionic wetters.

Wetout achieves the same or better efficacy at lower rates. It even outperforms specialized wetters on annual ryegrass—increasing the versatility of Wetout.

Wetout is the only all-season non-ionic surfactant needed. It is ideal for summer spraying because it increases uptake of glyphosate, spreading of paraquat, and helps to overcome some of the disadvantages of the new extremely coarse spray quality regulations for 24-D products.

Lower use rates

The old standard wetters are used at 200mL/100L. The superior performance of Wetout means it can be used at half the rate, 100mL/100L, to achieve similar or better results.

This means handling, transporting and storing half the volume.

Directions for use

SITUATION	APPLICATION	CRITICAL COMMENTS
HERBICIDE SPRAYS		Use of the higher rate is beneficial on difficult to wet surfaces or in high volume sprays
High Active Glyphosates	100-150mL/100L	
Glyphosate 360, MCPA, Dicamba, 2,4-D Amine	50-75mL/100L	
Paraquat and Diquat	50-90mL/100L	Vary rate according to spray volume. See product labels.
Soil Residual herbicides	25-75mL/100L	Apply to standing weeds to thoroughly wet foliage. Use when a surfactant is recommended. See product labels.
Selective herbicides	75-150mL/100L	

Environmentally friendly

Wetout is a uniquely targeted surfactant package based on a green, sustainable raw material backbone.

Unlike many adjuvants on the market across Australia and NZ, Wetout is also free from nonyl phenol ethoxylates (NPEs are banned across Europe and North America because they are endocrine disruptors).

All the ingredients in Wetout are biodegradable and break down into simple, harmless compounds over time—so our greener approach today will ensure a greener tomorrow.

Contact Martyn Jones at SST:
P 03 9720 6306 M 0410 491 485
E martyn@sstaustralia.com
www.sstaustralia.com

Canopies for crop protection and water storages

Canopies protect crops

The main advantage of canopy netting is that it does more than merely deter birds, it excludes them.

Bird netting needs to be hung above the trees to create a canopy.

Throwing a net over trees compromises the net as the tree continues to grow whilst the fruit is setting and ripening; and removing a bird net from new season growth is a nuisance—it can damage the new growth, and in many cases, ruins the net in the process.

If you are interested in conducting a trial, create a canopy from logs/poles in the ground, or a poly-pipe structure to protect your trees. The benefits of growing blemish-free fruit is so enjoyable you will wonder why you didn't act sooner.

Pollination & other benefits

A NetPro bird net with a 15 mm diamond weave allows continued pollination, as pollinating insects can access the flowers, but birds cannot.

Netting also brings with it a number of other advantages including:

- increased tree growth
- greater yield and fruit size
- enhanced fruit colour (depending on net colour)
- improved fruit quality due to bird/pest exclusion and the micro-climate created under the canopy.

Costs vs returns

Installation of netting involves a capital cost for net, structures and labour; and the continuing expenses for repairs and maintenance—all of which need to be offset against the returns resulting from higher fruit sales income, more reliable production and more efficient management strategies,

Our clients have advised us that their return on investment is approximately four years. Given that the life of the structures are much longer, improving the means of production is a simple equation.

NetPro exclusion net (L), throw-over net (R) and diamond weave.

Canopies minimise evaporation

NetPro have designed a canopy that reduces evaporation losses from water storages.

In some districts the canopy saved 90% of the water lost to evaporation.

Some jurisdictions in Australia lose upwards of 1.8m of water per annum. Over one hectare, a 90% reduction in evaporation losses equates to a saving of 16.2 megalitres per annum.

Water quality and other benefits

The Netpro water storage canopy also improves the quality of water and reduces algal blooms.

The weave of the cloth has been designed to keep the water cooler and to limit light and air pollution. As a result, problems with algal blooms are minimised, and so is the need for chemical treatment.

With a canopy in place, erosion is reduced. The canopy minimises wind and wave action erosion by 90%; and increases the life span of storage liners

The canopy sits proud of the bank. This restricts access by people and animals to water, so security is assured.

Canopies are custom designed to requirements and can be installed over dams that are full or empty. They offer:

- water savings from reduced evaporation
- increased security against unauthorised access
- pollutant and contaminant free water
- operational practicality
- design aesthetics
- structural longevity.

For more information call Lindsay
M: 0408 138 597
www.netprocanopies.com

NetPro canopies over dams. They minimise evaporation and secure water storages.

Advance or delay bud-break with Waiken®

Apple and cherry growers have greater control over bud break, flowering and time of maturity when they apply Waiken.

Depending on when it is applied, it can be used to bring forward, or to delay bud-break.

Generally:

- To advance bud-break, apply 35–50 days before bud-break would normally occur
- To set back bud-break apply from 20 days before bud-break would normally occur, up to the time of green-tip.

How to utilise Waiken in the orchard

Waiken induces a period of dormancy after which the flowers all come out fairly rapidly and uniformly. This means it can be used as a management tool to:

- bring forward or set back bud-break to help align flowering across varieties to achieve cross pollination
- bring forward or set back bud-break to stagger maturity to improve productivity at maturity and harvesting
- compact the flowering period to significantly improve the effect of chemical thinning treatments and improve productivity at picking
- promote limb growth in young fruit trees.

Thanks to its proprietary chemistry, Waiken allows growers to capitalise on the more profitable early markets.

Non toxic

Tools available for manipulating bud break include common chemical rest-breaking agents such as hydrogen cyanamide, which is toxic. Waiken is an emulsified vegetable oil compound.

Tips to improve effectiveness

- Fruit trees have a cyclic crop load from year to year: heavy, light, heavy etc. Waiken compacts flowering, so care needs to be taken if using primary thinners when a light crop is expected. An application of primary thinners such as NAA, Ethrel or ATS in this situation could severely limit fruit set and crop load. Secondary thinners such as Cylex are a safer alternative as the decision to thin is made later, when fruit set is visible.
- Ensure that sufficient pollinators and bees are available. This is very important as a reduced flowering period could result in reduced fruit set if the weather is unfavourable during this time.
- In the first year, carry out limited trials. Apply Waiken at two different timings and two rates. This provides important information to enable optimum timing and rate for subsequent seasons.
- Recommended rate is 4% on apples and cherries. Water volume should be sufficient to obtain good coverage of the buds to the point of run-off. This generally requires 1000–2000 L/ha water for apples and cherries.

Contact Martyn Jones at SST:
P 03 9720 6306 M 0410 491 485
E martyn@sstaustralia.com
www.sstaustralia.com

Apple grower says Waiken critical for pollination and fruit set

Stuart Douglass has Western Australia's only orchard of traditional old-world cider apple varieties.

These European style, high chill apples are specially grown for cider production (*real* cider). There are 15 varieties in the orchard with key varieties being Yarlington Mill, Browns Apple and Dabinett.

"Being high chill varieties, there was some initial concern that they would not set fruit in WA's temperate climate," Stuart said.

"Some varieties are also biennial bearers and others suffer from post harvest flowering. Given these challenges, it is critical that we manage dormancy, budbreak and tree growth to ensure that we set a crop every year for the life of the orchard."

To achieve adequate and timely flowering, and to manage the growth of young trees, Stuart relies on the application of the dormancy breaker, Waiken—which has now become an essential part of his orchard management program.

"A timely application of Waiken each year is critical to breaking dormancy and to flowering and pollination," he said.

"Waiken compresses the flowering period for each variety and we can get each variety to flower at about the same time which significantly improves pollination and fruit set."

No Waiken, no crop

Stuart said the benefit of Waiken was made obvious last season when six Dabinett trees were not sprayed adequately. (Dabinett is one of the most challenging varieties to set fruit.)

Effect of an application of Waiken (left) on the apple variety Dabinett. Photos taken on 31 October 2017. Untreated tree (right) flowered in December 2017 and did not set fruit.

"Those six trees did not flower until December—well after all the other sprayed trees had finished flowering and had set fruit," he said.

"It proved to us just how effective Waiken is in controlling budbreak and flowering in our high chill varieties when the recommended chill hours are not met.

"With Waiken, each variety sets fruit every year, the trees remain calm, and we are better able to control vegetative growth and have minimised biennial bearing."

Stuart added that if the *real* cider industry in WA is ever to become established, it will rely heavily on the application of Waiken to manage budbreak and flowering to optimise fruit set.

Contact Stuart, phone 0407 232 649
email stuart.douglass01@gmail.com
www.realcider.net

Prepare as climate change brings more spring frosts

A common theme of climate change is the greater number of spring frosts challenging growers in both the northern and southern hemispheres. Whilst average temperatures are rising, there are greater extremes in terms of hot and cold events.

Australia

The Bureau of Meteorology in Australia has released the first 20 Regional Weather and Climate Guides, which will give growers the best possible guide in terms of climate risk and opportunities. This includes frost risk as well as rainfall and temperature trends.

Spring frost more common

The reports show that in the last 30 years, spring frosts have been more common and occurring later in the NSW Murray and Riverina regions as well as the Victorian Mallee region. Inland parts of south-east South Australia have also experienced more frosts.

More frosty nights tend to occur through dry winter and spring periods when soil moisture is low and cloud cover infrequent.

Research confirms longer 'frost season'

Researcher Patrick Fresne recently published an article on climate change and its effects on the Australian almond growing industry.

He observes that despite the warming trend, the minimum temperatures recorded in Riverina weather stations for the month of August seems to be falling ever lower with the passing of the years.

In both 2017 and 2018, unusually cold late August conditions resulted in significant damage to the crop of many almond growers around Griffith and Hillston.

In a paper published by CSIRO, *Recent changes in southern Australian frost occurrence: implications for wheat production risk*, the researchers' analysis uses Stevenson screen temperature thresholds of 28C or below as an indicator of frost at ground level. This demonstrates that across southern Australia, despite a warming trend of 0.178C per decade since 1960, 'frost season' length has increased (on average) by 26 days across the whole southern portion of Australia compared with the 1960–1990 long-term mean.

Some areas of south-eastern Australia now experience their last frost an average four weeks later than during the 1960s.

Analysis of the observed minimum temperature record has revealed that over the last six decades, the frequency of minimum temperature events below 2C has increased and the period between the first and last minimum temperature at or below 2C has broadened.

Another paper, *An investigation of some unexpected frost day increases in southern Australia* concludes: "frost days have increased in May in south-eastern Australia as well as in spring in some locations over the period from 1980 to 2011.

The south-eastern Australian frost increases are strongly linked to a decrease in the number of wet days in the area. These results confirm that the recent drying trend in south-eastern Australia has resulted in more frequent very cold nights and more frost days.

In south-west Western Australia, frost days have increased in late winter and spring."

Frost protection & Return on Investment

Stu Powell from Climate Consulting regularly provides advice and wind machine placement for large growers in New Zealand and Australia.

Decisions concerning frost protection can be made scientifically.

The expansion of orchards and vineyards into increasingly challenging environments places a greater emphasis on quantifying risk before you develop and; ensuring frost mitigation is positioned correctly and is reliable.

Climate Consulting has been delivering site-specific detailed reports to clients in New Zealand and Australia for over 18 years.

Stu insists that implementing the most effective method of frost protection together with correct placement saves clients substantial money and anxiety.

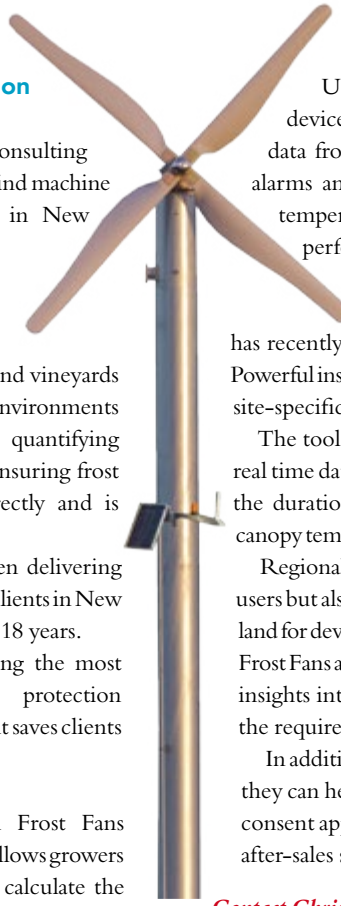
Online tool for calculating RoI

Early last year, Australian Frost Fans launched an online tool which allows growers to run their own numbers to calculate the Return on Investment from installing frost fan/s.

Loncel frost fan monitoring

As a sister business to New Zealand Frost Fans and Australian Frost Fans, Loncel is the market leader in frost fan monitoring across Australia and New Zealand.

By far the majority of frost fans installed by New Zealand Frost Fans and Australian Frost Fans are specified with Loncel's monitoring option.



Using any internet connected device, growers can access real-time data from their fans, together with text alarms and historical data and graphs on temperature, run-hours and machine performance.

Loncel is continually improving its monitoring software and has recently added a regional reporting tool. Powerful insights are now available at a regional, site-specific and individual machine level.

The tool allows users to see historical and real time data on the number of fans running, the duration of frost events and tower and canopy temperatures (temperature inversion).

Regional data is not only useful for existing users but also for growers looking at acquiring land for development. By talking to Australian Frost Fans as early as possible, they can provide insights into the number of frost events and the requirement for frost protection.

In addition to assisting with due diligence, they can help with suggested fan layouts and consent applications (if required) through to after-sales servicing.

Contact Chris Kay
chris@nzfrostfans.com
or visit
www.aussiefrostfans.com.au — supply and installation of FrostBoss frost fans and monitoring hardware in Australia.
www.nzfrostfans.com —supply and installation of FrostBoss frost fans and monitoring hardware in New Zealand.
www.loncel.com — frost fan monitoring

Contact Chris for a list of links and references.

Accurate, efficient automatic dosing pump

Fertiliser injection equipment is used to introduce water soluble fertilisers, minerals, pesticides and wetting agents via the irrigation system to increase and improve crop production and delivering directly to the root zone.

The newly developed DOSTEC AC dosing pump is available as a diaphragm or piston dosing pump with advanced control for an accurate and efficient automatic dosing.

The flow range covers from 3 to 1200 L/hr with an operating pressure up to 1500Kpa.

The correct selection of head materials PP, PVDF or S.S. makes the pump suitable for most chemical products used in agriculture.

The dosing pump has a range of operational modes: Analogue Control (4-20mA), proportional pulse control, batch dosing control by volume and time, and manual flow control.

The dosing pump inputs include 4/20Ma, external water meter pulse output, flow detector input, pressure sensor input and level sensor input pre-empty and empty.

Contact Gary Horton, Triangle Waterquip
P: 03 9580 2122 M: 0427 033 967
www.trianglewaterquip.com.au

Parka enhances the fruit's natural defences

What: Parka is a food-grade elastic biofilm made of phospholipids that protects crops from the effects of excessive water and heat.

Parka is designed to strengthen the plants natural cuticle—the plant's first line of defence.
How: Parka protects epidermal cells from environmental threats by forming an elastic, protective shield to maintain the integrity of fruit and foliage as the crop develops.

When: Start Parka applications at fruit set, so it can continue to strengthen the cuticle layer during the most vulnerable time in the growing process.
Why: Parka is the industry standard worldwide that reduces cracking in cherries, stem-end splitting in apples and inking in stonefruit.

Early application

Early applications of Parka reduce the development of micro-fractures while supplementing the cuticle in fruits to protect the delicate skin from dust, rain, and heat-related and air-quality complications.

Parka is a key tool used in Spain, Chile, Canada, USA and Australia, to combat extreme weather conditions for increased pack-out and a longer shelf life.

Contract Russell Fox, InSense
M: 0428 570 394 E: russell@insense.com.au
www.insense.com.au

Understand fruit trees: an orchard manual that enriches grower knowledge

Unfortunately the answers to many questions about why and how fruit trees grow and produce fruit are found in scientific journals. These are not written for orchardists.

Grower magazines, seminars, conferences and field days are supposed to translate much of the results from the scientific work.

Extension officers, representatives of chemical companies and consultants all play their parts in bridging the gulf between the researcher and the ultimate user, you, the fruit grower. But are we doing this well enough?

Fundamentals needed for progress

Producing fruit successfully in today's competitive world–market, requires that you constantly aim to maximise crop value by optimising yield, maximising fruit quality, and improving production efficiency.

To achieve these goals you must integrate new production technologies with your fundamental knowledge of tree performance.

Fundamental knowledge of tree performance often means going back to the basics of how fruit trees grow and produce fruit.

Grower understanding is key

It takes an entire chain of events to grow the fruit and then guide it from the tree to the packing house and the supermarket shelf. But it all begins with the fruit grower.

> *Understand Fruit Trees* links sunlight, root growth, soil and water so you can see the big picture. This will equip you with enough basic knowledge to make sound decisions.

You must make the early decisions on how you plan to obtain the best yields of the highest quality fruit, while keeping cost of production to a minimum.

The pressure for tomorrow is to be more productive than today. To survive in the 21st century, fruit growers must produce more and better fruit, for less.

'Knowledge' needed to maximise productivity

We are at a time when all aspects of fruit production have become management and information intensive. You have to have the knowledge about fruit production—and know how to use it.

Knowledge is fundamental for problem solving and maximizing resources in the orchard.

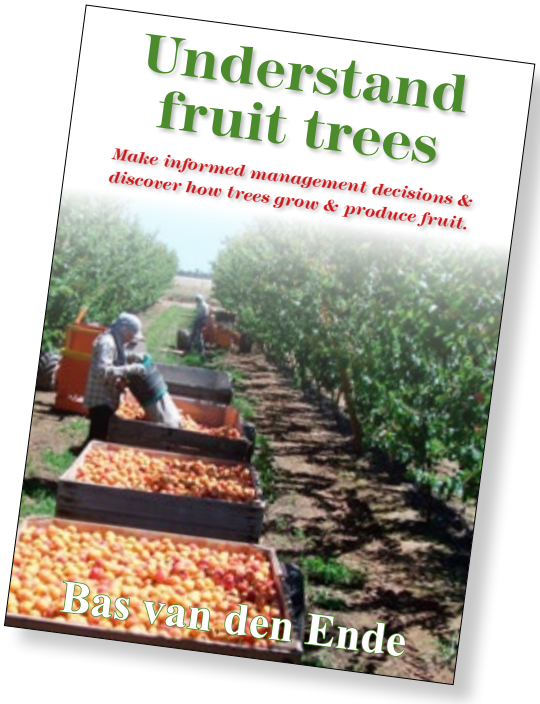
Manual aims to enrich grower knowledge

Our latest orchard manual, *Understand Fruit Trees* is written to enrich your knowledge—it provides the basic information needed to help you manage cultural practices in a timely manner, and to make more informed decisions.

It is an adjunct to the other orchard manuals written by the same author.

Understand Fruit Trees links sunlight, root growth, soil and water so you can see the big picture. This will equip you with enough basic knowledge to make sound decisions.

For more information or to buy this manual, visit treefruit.com.au or orchardmanuals.com.au



***Understand Fruit Trees* is written by Bas van den Ende.**

Bas's involvement and interest in the fruit industry spans 60 years, during which he has written or co-authored more than 300 scientific papers, Agnotes, chapters in horticultural books, articles in national and international horticultural journals and magazines, and orchard manuals.

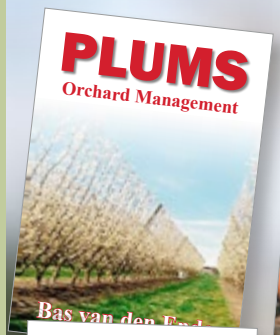
Products & Services

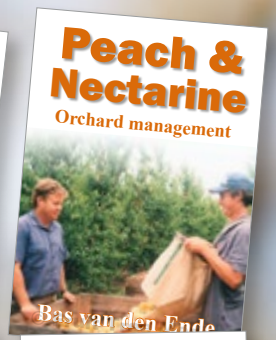
Orchard Manuals

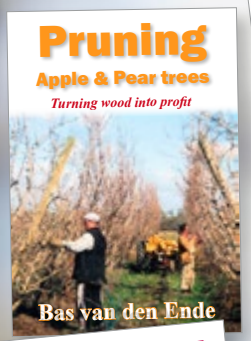
—for growers—

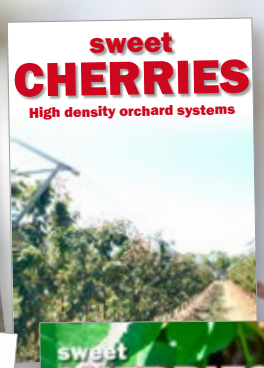
- Practical
- Latest tree training techniques
- Latest orchard management practices
- Step-by-step instructions
- Packed with photos, illustrations & drawings

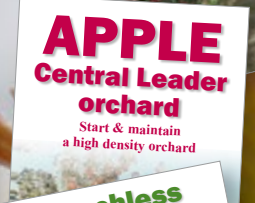
Easy to download & print

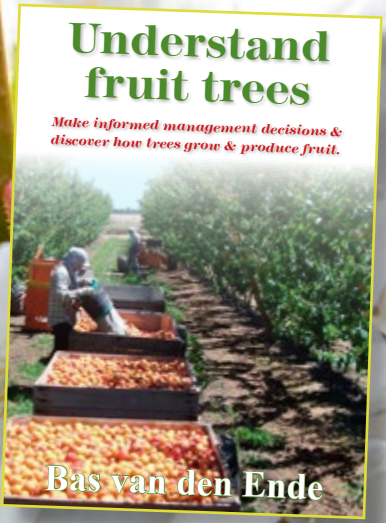


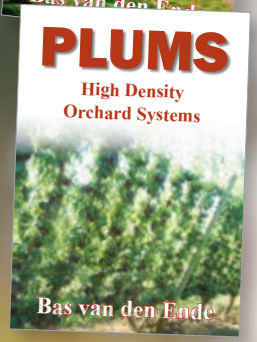


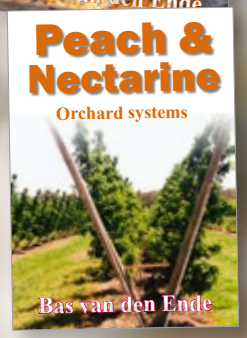












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