Growers discover ways to save energy

On-farm fruit fly management

Getting the most out of chemical thinning

Tree registry project starts
The results prove Bogard® continues to deliver.

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FROM THE EDITOR

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Sophie Clayton

OUR COVER:
Amanda Booth, KMH Environmental, has completed energy audits on 30 packing sheds and orchards Australia-wide to help growers cut electricity costs (see pg 10 and pg 18).

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Sophie Clayton

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APAL would like to thank our partners who provide us with funding and support.
The official launch of the results of our ‘Watts in Your Business’ project at Rocky and Carolyn Varapodio’s packhouse was a well-attended event with wide recognition that the outcome of this project has the potential to deliver significant savings in growers’ energy costs, the next highest expense after labour. We were fortunate in having two federal parliamentarians who are passionate supporters of agriculture and regional Australia, Dr Sharman Stone MP and Senator Bridget McKenzie, to launch the event. Useful fact sheets are available on APAL’s website.

The AGM and Levy Payers’ Meeting are necessary but important events. The AGM provides an opportunity for the Board and management to give an account of APAL’s activities during the previous year, and to deal with statutory matters such as the appointment of directors and discussion of the financial reports. In my report to the meeting I made particular mention of the talent that exists amongst the APAL staff led by John Dollisson. I am always impressed by the commitment given by this team to achieve better outcomes for growers.

At the Levy Payers’ Meeting the results from a number of research projects were outlined as were the results of recent marketing campaigns. I urge you to read the Industry Advisory Committee’s annual report – also available on the APAL website – which contains a full account of expenditure of grower levies.

The week wrapped up with a Board meeting. The main item of business was signing off on a 5-year Strategic Plan for APAL’s operations. The key goals are to lead the industry in increasing exports by 2 percentage points per annum, to reach 10% of fruit marketed by 2019, and to at least maintain – but ideally grow – domestic per capita consumption. Given recent trends these are ambitious targets, but ones that we believe are achievable with the right strategies and collective effort. I’m encouraged by more export success stories this season which bode well for the future.

While on the subject of exports, Pink Lady™ volumes are slowly gathering momentum. Fifteen years ago exports to the UK hit their peak with upwards of 200 containers a year, with a steady decline over the ensuing years to very minimal volumes. Now the tide is beginning to turn with a focus on Asia in addition to the UK. AFFCO managed the UK program on behalf of grower-owned Pink Lady Australia Limited (PLA), followed by APAL in the last couple of years. Now PLA is being folded into APAL, which will continue to manage it with input from an advisory committee. A number of growers have given much time and input as directors of PLA in order to get the best results for the program – as chairman I am immensely grateful for the support given by Ben Darbyshire, Harvey Giblett, Mark Joyce and Scott Montague.

I am pleased that Minster Joyce is proceeding with the election commitment to review the import risk analysis (IRA) process. The long-running and unsatisfactory IRA process for assessing the risk of fireblight still reverberates through our industry. We will be making a detailed submission to the review.

Some timely advice to the government recently came from the Business Council of Australia. The Council is seeking greater leadership in several areas: it wants a 5-10 year vision for Australia; a better understanding by government of key sectors of the economy; and the adoption by government of a greater facilitation and co-ordination role. This push by the Council resulted from work it commissioned from McKinsey on Australia’s competitiveness which highlighted agriculture as the only industry that is strongly competitive and still having plenty of potential. This is a strong message from the top end of business which the government ignores at its, and the country’s, peril.

‘Inglorious fruits and vegetables’. What does that conjure up? For France’s third largest supermarket chain Intermarché it means a business opportunity. It has created a special category for imperfect, to the eye, produce. Watch the YouTube video, 3.5 million others have. Good food for thought.

John Lawrenson  |  m: 0417 391 786  
e: jalaw@bigpond.net.au
So that APAL can effectively represent you we need your help in two areas, they are:

1. **Join APAL:** We need as many of our 600 growers to be members of APAL as possible. At present we have less than half, and many of you assume if you get the magazine or have a member logon to the APAL website you are a member. But for a lot of you that is not the case and we need your membership to demonstrate we are representative of your views, and, importantly, with the creation of a new Horticulture Australia Limited, which will be grower-owned, we want to make sure you are represented. So please assist by either calling APAL to see if you are a member, completing the membership form online at www.tinyurl.com/joinapal, or, when you get a call over the next month from an APAL staff, please assist them to collect your details. There is no cost in being a member and your updated details will ensure you get all the relevant communications.

2. **Data collection:** Improved data both on the growing side of the business, and on the packing/marketing part of the business.

   a. On the growing side, we are about to commence developing the Tree Registry database (see page 16) so we can better manage industry profitability, enable you to benchmark your orchard against the industry, assist in advising what varieties to plant, where we may have oversupply in the future, and to better market our fruit. The consultants AgFirst will be contacting you in September to collect this data or you will be able to input it via the APAL website. We have not had any reasonable tree data since the Australian Bureau of Statistics significantly increased the price of collection back in 2007/08 and stopped their core data collection for our industry. Please assist in providing your data and I promise you it will be put to great use and fed back to you in a usable and beneficial way.

   b. On the packing shed and marketing side we again don’t have any really effective data to manage the business. Here we have two initiatives underway, the first is revamping the coolstore stocks collection called Infopome, which at present is monthly and poorly reported. It is in the process of being redone on a weekly voluntary opt-in basis with representative pack houses across all states. Once we have the new system designed (October), I will communicate to all the packing sheds so we can start to obtain effective data to manage the industry. In addition to revamping Infopome we are also pulling together data on packing shed and marketing costs for large, medium and small facilities with an aim to place this on the APAL website so you can assess your facility or your packers against industry norms. This should assist you in the decision as to whether you should continue to run a packing shed and encourage more transparency from the larger packing sheds so we can become more efficient as an industry.

I am sure you have all heard the old adage “you get out of it what you put in” or the oft used reference in data collection “garbage in garbage out”. We all need to contribute for the betterment of the industry as a whole. Individually you will also benefit through the development of new varieties to meet consumer demand, better and improved packing through better priced outlets, and a more consistent quality.

So as Uncle Sam said many years ago, and Uncle John says now, we need your help, to help yourselves.

---

**Uncle John needs you!**

**By John Dollisson**

**CEO, APAL**

We have a number of challenges facing our industry and you are better aware of them than me, but these include, high labour costs, shrinking production, increased retail pressure, rising costs etc. etc.
The annual meeting of apple and pear levy payers, where representatives of Horticulture Australia Ltd (HAL) report on the progress of projects it funds with the apple and pear levy, took place at the APAL Industry Summit on 25 July 2014.

Chair of the Apple and Pear Industry Advisory Committee Julie Haslett opened the meeting, thanking everyone for their involvement in the IAC over the year. While Barbara Romero-Cespedes, the HAL Industry Services Manager for the apple and pear industry, provided an extensive update.

“Our aim is to maximise the benefits to the levy payer through the investments in the marketing and R&D programs,” said Barbara.

“In 2013-14, $3.6 million was invested in R&D and $3 million was invested in marketing. In addition to this there are voluntary contributions which are matched by the government for R&D investment, which were around $2 million,” she added.

Barbara highlighted the apple and pear industry Asian export market development initiative that has successfully assisted to increase exports of apples to Malaysia and Thailand which increased by 66% and 33% respectively last year. She noted the roles of the Department of Environment and Primary Industries, Victoria, (DEPI) and APAL’s Market Development Manager, Claire Fitchett, in contributing to the success of this work.

The development of two new pear varieties by DEPI and Prevar’s work to breed and commercialise new varieties was given as an example of another successful project delivering outcomes to industry.

Marketing investments and progress in marketing pome fruit was presented by David Chenu, HAL’s General Manager – Marketing Services. In a video presentation, HAL’s Marketing Manager for apples and pears Luke Westley noted the success of the Australian Pears marketing campaign for 2014.


Promotions of Australian Pears in recipes by celebrity chef Curtis Stone have supported sales at Coles, while Woolworths' launch of the second edition of the Australian Pears cookbook has also been successful.

For Aussie Apples, Luke said the focus has been on “lifting retail value without reducing consumption” and that various promotions across social media have helped achieve this.

The Apple and Pear Industry Advisory Committee Annual Report 2013-14 contains summaries of all the progress of the marketing and R&D investments over the year.

“"Our aim is to maximise the benefits to the levy payer through the investments in the marketing and R&D programs." ""
Key Stakeholders’ Roundtable meeting

Leading apple and pear growers from across the country, who account for more than 50 per cent of national production met at the Key Stakeholders’ Roundtable meeting as part of APAL’s Industry Summit.

They discussed ways to collaboratively build the industry’s profitability and sustainability and address issues of common concern. The five recommendations resulting from the Roundtable included:

1. Upgrade the cool store reporting system (InfoPome) so that it is updated weekly to enable growers to make more informed marketing decisions.

The Key Stakeholders present all agreed to nominate someone in the business to contribute data weekly to ensure InfoPome was accurate and current. APAL agreed to manage InfoPome weekly and develop a simpler online system to facilitate updates and distribution of information to contributors.

2. Increase export volumes of both apple and pears to 10% of marketable production in 5 years.

This equates to a total of 1,000 containers (20,000 tons) of apples and 500 containers (10,000 tons) of pears by 2019. The goal for 2015 is 200 containers (4,000 tons) of apples and to maintain or grow the volume of pear exports from 2013 (6,300 tonnes). The Key Stakeholders present all agreed to look for opportunities to increase their exports. APAL will continue its support of export market development by running promotions and educational campaigns in Asia, leading grower visits to export destinations, hosting importer visits to Australia, and participating in relevant international trade shows.

3. Develop a variety matrix of apple and pears, showing variety owners, ideal growing conditions and contact details of the variety owner/manager.

APAL will prepare the variety matrix, which will help growers identify what variety options are available to them, which ones will best suit their environment and what marketing support is available for trademarked varieties. This will help growers make more informed decision about which varieties to grow.

4. Compile packing shed cost structures so companies can benchmark themselves against others to identify where improvements could be made.

APAL will commence a data collection process of packing shed costs to build a rigorous model, similar to the Orchard Business Analysis.

5. Develop national quality guidelines to improve apple quality, including brix, pressure and appearance characteristics.

APAL will work closely with HAL to finalise the draft quality guidelines for Australian apples.

APAL will implement the recommendations it has been tasked to complete and will report back at the next Key Stakeholders Roundtable meeting, and via APAL’s newsletter Industry Juice, the APAL website and Australian Fruitgrower.
Melbourne Cup Promotion

Get a finish to your season!

You can’t always back a winner, but you can bet on Photon to protect your crop from environmental stress.
Have a GUARANTEED WIN by purchasing Photon before Melbourne Cup.

Photon, containing a blend of dicarboxylic acids naturally found in plants, manipulates the plant stress sensors so that it can react more quickly and effectively to stress events like excess heat thus maintaining as much productivity as possible.

Key benefits of this high quality water soluble granule formulation include that it leaves no visible residue, protects foliage, flowers and fruit, is applied at ultra-low rates, is very cost effective and provides excellent rainfastness after 4 hours.

Early season and repeated applications are the key to success.

See your Photon Agent for details.
New Brand Manager for Pink Lady® in SE Asia

Pink Lady® Development Ltd has appointed Mr Ryan Au as its new Brand Manager to support the marketing and development of Pink Lady® apples in South East Asia.

Ryan has a number of years of experience in marketing and promotion of produce. His focus will be on further developing the network that has been established so far to support the Pink Lady® brand in the region. He will be based in Kuala Lumpur, Malaysia.

Pink Lady Development is a joint venture company shared between APAL and Star Fruits, who are also APAL’s European Pink Lady master licensee. Pink Lady Development oversees the development of emerging market opportunities for the Pink Lady brand and supports product investment.

The company also promotes and develops Pink Lady trademark activities and usages, manages promotion and development funds, assists in the selection of import licensees and/or licensed distributors, and assists licensed suppliers in technical packing and quality management. It also helps to better co-ordinate supply and quality controls, which will assist in managing the reputation of the Pink Lady brand, and support Cripps Pink and Cripps Pink Mutations owners in the management of their varieties in producing territories.

Ryan will attend Asia Fruit Logistica in Hong Kong this year and can be contacted on ryan.au@pinkladyapples.com.

Senate reports on fenthion, fruit fly

The Senate Rural and Regional Affairs and Transport References Committee have delivered their report on fenthion, which is used to control fruit fly. They have recommended a 12-month phase-out transition period, simpler but not weaker chemical regulations and enforcement of on-farm biosecurity standards.

Better cooperation and communication across all levels of government, and support and funding to fast track a National Fruit Fly Strategy following its review, were also recommended.

The report will be used by the Australian Pesticides and Veterinary Medicines Authority (APVMA) as it reconsiders the approvals, registrations and product labels associated with fenthion.

APAL provided a submission to the Senate committee in January 2014 and has followed up with a submission to APVMA to propose a 2-year phase-out period should fenthion be banned.

In other fruit fly news, Mr Jon Durham, former General Manager of APAL, has been appointed as the chair of the National Fruit Fly Strategy Advisory Committee. The first face-to-face meeting of the committee was on 14 July and members discussed how best to implement the National Fruit Fly Strategy.

News Snippets

Nine Mile Fresh opens

Australia’s largest fruit packing shed and cool store has been officially opened in Tynong, Victoria.

Nine Mile Fresh, a collaboration between Bonview Orchards and Battunga Orchards, can process 20 tonnes of fruit an hour over its pre-sizer and handle up to 500 bins in an eight hour shift.

$10,000 apple/pear scholarship

APAL is offering a $10,000 scholarship to go toward tuition fees for a Diploma of Agribusiness. Anyone working in the apple and pear industry in a nursery, orchard, pack house or cool store can apply.

Applications close 16 Jan 2015. Go here for more information and to apply: www.tinyurl.com/2015APALscholarship

Neonicotinoids bad for birds

Research has shown that declining insectivorous bird populations are linked to high neonicotinoid pesticide use. This is in addition to the negative effect neonicotinoids have on non-target invertebrate species including pollinating bees.

The news comes as the UK government comes under increasing pressure to ban neonicotinoids following Europe’s ban of the pesticide.

See nature.com | farmersguardian.com

2014 forecast for EU pome fruit

The World Apple and Pear Association has released the 2014 European apple and pear crop estimates. The 2014 apple production in the EU will increase by 9% compared to the crop of last year. Regarding pears, European growers predict a decrease by 2% compared to last year.

See freshplaza.com
Launch of ‘Watts in Your Business’ energy saving walks

More than 50 people came along to the national launch of the ‘Watts in Your Business’ energy saving walks in Ardmona, Victoria, to learn how to cut electricity costs in their packing sheds and orchards.

The national launch of the walks was hosted in the shed of local fruit grower, Rocky Varapodio, with special guests Senator Bridget McKenzie; Dr Sharman Stone MP; and Jenny Houlihan, Shepparton Mayor.

During her official launch of the event, Senator McKenzie noted the high cost of labour and electricity for fruit growers and how important it was to find solutions – like saving energy – to help make businesses more profitable.

The energy saving walks have since been run in all major fruit-growing regions across Australia. At each event Amanda Booth, Environmental Consultant with KMH Environmental, who undertook energy audits of 30 orchards and packing sheds across Australia, presented her findings.

“Through this program we were able to identify around 10 opportunities per site which would reduce electricity consumption. The average saving after implementing the ‘cost effective’ upgrades was 13 per cent,” Amanda said.

During each walk, participants were shown around the hosts’ packing sheds discussing options to save energy with the service providers present. A whole array of energy-saving options were presented from simple options like sealing air compressor leaks, to installing solar panels on irrigation shed roofs and connecting voltage power optimisation units to electricity supplies.

Amanda also encouraged all growers to discuss their tariffs with their electricity providers to try and get the best deal possible.

Amanda’s presentation, flyers and case studies with detailed information about how to save energy were distributed at the walks and are all available on the APAL website at apal.org.au/watts-in-your-business.

‘Watts in Your Business’ is managed by APAL, undertaken with Summerfruit Australia Limited and Cherry Growers Australia Inc., and funded under the Australian Government’s Energy Efficiency Information Grants program. KMH Environmental have completed the audits and are preparing the reports with the assistance of Michael Bellstedt and Ananth Arkal of Minus 40, and Sam Birrell of Netafim.
Lawrenson emphasized that APAL was here to serve members and support the industry, but “we always need to challenge ourselves to do better”.

He concluded by saying that he thought that the industry was in “the best shape I have ever seen”.

Sponsors E.E.Muir & Sons, Agrofresh and J-Tech Systems were noted for their support of APAL.

APAL CEO John Dollisson shared some industry statistics around production and consumption that are helping to break some old myths.

“Domestic consumption is stable for apples and slightly increasing for pears,” said Dollisson.

Improved marketing for apples domestically and a much sharper focus on increasing exports will help the industry, he said.

He also noted that for the first time ever APAL will have its own strategic plan to outline how the organisation can best contribute.

“One measure of our success is our capacity to increase your profits,” said Dollisson in speaking to the APAL members and apple and pear growers present.

Kevin Sanders, representing Victoria, and Mr Greg Mouat, representing NSW, were re-elected to the Board and a special resolution was passed to allow John Lawrenson to continue on as the APAL Chair until the 2015 AGM.

Following the AGM, participants joined in a cider and perry tasting sponsored by Lobo Ciders, Too Many Chiefs, and Snakes and Ladders and an industry dinner.

Women in Horticulture
Boonah, QLD
2 Sep 2014

Pear Orchard System Field Day
Tatura, VIC
3 Sep 2014

Tasting to define cider styles
Launceston, TAS
3 Sep 2014

Asia Fruit Logistica
Hong Kong
3-5 Sep 2014

Royal Adelaide Show
Adelaide, SA
5-14 Sep 2014

Nuffield Australia National Conference
Launceston, TAS
17-19 Sep 2014

Royal Melbourne Show
Melbourne, VIC
20 Sep – 1 Oct 2014

APAL Board meeting
Melbourne, VIC
22 Sep 2014

Apple and Pear Industry Advisory Committee (IAC)
Melbourne, VIC
23 Sep 2014

Perth Royal Show
Perth, WA
27 Sep – 4 Oct 2014

Australian Cider Awards and 2014 Australian Cider Festival
Melbourne, VIC
10-12 Oct 2014

Horticulture – The Next Generation
2nd workshop
Melbourne, VIC
13-14 Oct 2014

More event info:
apal.org.au/events

We want to know about your local events for fruit growers! Please submit your events to cm@apal.org.au to get listed here and on APAL’s website.
New South Wales

In August 2014, farmers within Orange welcomed a visit by APAL representatives.

The meeting proved fruitful and was very laid back. Growers were encouraged to openly discuss concerns regarding the industry over a relaxed glass of wine and an enjoyable meal, at The Parkview Hotel. It was a successful event and we are sure APAL took many ideas on board.

As we write this, weather bureaus are forecasting increased falls within the coming days. With dam levels at only around 50%, this will be extremely welcomed. A reduction in crop yields of about 30% has resulted in strong market prices and high demand. Wouldn’t it be great if we could increase consumer consumption/demand on a constant basis without any reduction in crop yields.

It is fantastic to see fellow farmers full of optimism and it will be wonderful to see this continue for many more seasons.

Guy Gaeta
Communication Officer,
NSW Farmers Association

Tasmania

Apple growers from across Tasmania contributed to the recent industry skills analysis, including a series of round-table workshops held in each region.

Being the first full skills analysis ever conducted across the Tasmanian fruit sector, growers took the opportunity to raise points and issues around training and sustaining a current workforce while planning to meet skills and employment needs as the industry grows into the future.

The round-tables formed the culmination of the survey process which saw the highest percentage of responses from any agricultural or fisheries skills survey ever conducted across Australia. Moving forward, the project will undertake the development of the Workforce Development Plan under Skills Tasmania. FGT extends its appreciation to Agrifood Skills Australia, Stenning & Associates, Tasmanian Government and Skills Tasmania.

The ‘Watts In Your Business’ workshop, held at Scott Bros orchard and pack-house at Cairns Bay in Southern Tasmania, was well attended by apple and cherry growers. It was interesting to hear the comments with growers finding the information useful in making changes in their operations, commencing savings in energy costs quickly while preparing long term energy saving strategies.

FGT continues to be involved in broader issues across the industry, including working with CSIRO and the honey industry on varroa mite threat. This work is on the back of the swarm-sensing technology which now has trial hives operating in a southern orchard.

With European bumble bees becoming increasingly common in Tasmania, FGT is lobbying State and Federal Governments for the removal of the insect as an exotic pest in order for research to be undertaken.

Phil Pyke
Business Development Manager
Fruit Growers Tasmania
Western Australia

POME WEST HAS NOW FORMED AND WILL TAKE ON A RANGE OF LOCALLY IMPORTANT PROJECTS.

The first meeting of the Agricultural Produce Commission’s Pome Sub-Committee was held on the 15th of August. The sub-committee will be known as Pome West and its five members represent a diverse range of business models. This committee is responsible for approving pome related activities funded by the pome fruit fee-for-service collection. There is representative from all of WA’s growing regions.

Almost all of the issues discussed at the meeting came back to the importance of communication and re-engaging the state’s pome fruit growers. The first priority on the list is to update the contact details of growers and their preferred methods of communications. Secondly the committee wishes to conduct a series of grower meetings to begin reviewing and formulating the industry strategic plan.

The current projects funded by growers’ fee for service include:
- Quality management and maturity testing
- Codling moth surveillance
- Co-contribution towards the HAL funded sustainable management of Medfly without cover sprays project
- Natural mite control
- Commercialisation project
- Flavonoid project
- Promotions and event sponsorship

It is important for growers to be aware of these projects to assist in making assessments on their effectiveness, priority and contributing to the discussion of what future projects the fee-for-service should be directed to. This activity has been set as a high priority by the committee and they would like to see as many growers as possible attend meetings when requested.

Pome West are looking to create a positive and productive phase for the WA pome fruit industry to reverse current trends and re-invigorate interest in pome fruit and its consumption.

Stephanie Faggetter
Pome and Stone Fruit Industry Development Manager
Fruit West

Pome West has now formed and will take on a range of locally important projects.
Victoria

Victoria experienced a very mild start to winter this year so the thinking of many orchardists is that the pome fruit production season may be delayed. This should not impact tonnages or pack out. But it could create time management issues later in the season especially for those growers who have other late-ripening fruits.

Most growers have completed winter pruning and are now planning their Integrated Pest and Disease Management program for the 2014-15 season. In the Goulburn Valley and northeast, some are busy with stone fruit trees already in blossom.

Fruit Growers Victoria is responding to the reduction in pear intakes by SPC Ardmona by holding a Pear Orchard System day in the Goulburn Valley early in September. Many growers have limited options and as result want to market fruit in the fresh market, but this can only be done successfully if the significantly higher fruit quality requirements for the fresh market are met.

Growers must look into alternative growing practices, especially in terms of tree training and winter pruning in order to optimise pack outs. If this is not done they will have difficulty in turning a profit because growing second grade fruit in an over-supplied market does not have a future.

During the field day, growers will be able to see the behaviour of new varieties and new rootstocks as well as results from different irrigation regimes and different tree training system. Cordon and multi-leader systems will be on view in experimental blocks and commercial orchards.

There has been increased pressure from QFF during the last season. It is now essential that all growers in the north of the state have a QFF program. Growers in the Goulburn Valley should be getting ready for the new season with more traps. Control strategies include protein baits and male annihilation techniques (MAT) (see page 26 for more on fruit fly management).

At the July HAL and APAL workshop on QFF held in Tatura, Dr Eric Jung from the US Department of Agriculture stressed that the only way to get successful results was large-area control measures and growers must understand that participation by everyone is crucial. It is foolishness to think that you do not have QFF so you don’t need a QFF control program because if you do not have a program you will get it and so will your neighbours!

Fruit Growers Victoria is looking for orchardists to volunteer to help out at the Royal Melbourne show. Consumers love to talk to the people who grow the apples, so any orchardist who can spare a day from 20 September will be most welcome. You will be in the ‘Paddock to Plate’ section and will be selling fresh apples and making apple slinky as well as selling apple juice, pressed live. Sign up by contacting Julie Godwill on 03 5825 3700.

The Aussie Apples school program promoting healthy eating in primary schools just secured another round of funding and show bags complemented with fresh apples will be shipped to schools around the State at the end of term 3 and start of term 4. Participating schools receive a show bag with 2 apples for every child in Prep and grades 1 and 2, as well as a slinky slice per class, a DVD on apple production and instructions for teachers. Schools’ interest for the program is very high this time and FGV is looking forward to work with as many schools as possible.

John Wilson
General Manager
FGV

South Australia

We have been lucky to enjoy a wet and cold winter, with rains across most of the growing regions well above average for June and July. Most on-farm water storages are full and the soil profile is also full. Growers now are hoping for some finer weather to get on top of pruning and for the ground to dry out a bit for orchard access.

Several growers this year are busy planting trees. Certainly the level of planting activity is higher than in recent years as growers try out several newer varieties as well as newer strains of established varieties. It is clear that the varietal mix will be quite different in the years to come. Early September always heralds the start to a very busy time of year as growers try to keep on top of a variety of orchard activities and this year is no different.

Winter was also a very busy period however, with many different workshops, meetings and crop walks held on a wide variety of topics.

Susie Green
CEO
SA Apple and Pear Growers Association
The National Residue Survey results for 2013-14 show that Australian apples and pears are upholding high standards.

During 2013-14, samples from 314 apples and 110 pears were collected from packing sheds and central markets Australia-wide for testing by the National Residue Survey (NRS). The results showed that compliance rates with the standards were 98.1 per cent for apples and 100 per cent for pears.

Chris Williams, Assistant Director for Plant Programs, NRS, says these results continue to demonstrate that Australian apple and pear producers use in-crop and post-harvest agricultural chemicals according to good agricultural practice. The results also provide assurance to customers of the excellent residue and contaminant status of Australian pome fruit.

Sampling

Samples are collected according to NRS protocols by either the quality assurance (QA) manager at the packing shed or by approved third-party samplers in wholesale markets and packing sheds, which may include officers from government departments of agriculture, private consultants and/or NRS officers.

Each three-kilogram sample of apples or pears is selected at random from the produce of a specific grower. The origin of the samples and the number of samples collected are proportional to the level of production in each state.

“We continue to encourage all growers to have samples collected through their packers,” said Chris. “If that’s not possible, it can be direct off farm or through the wholesale markets.”

The NRS apple and pear program aims to continue sampling each Australian grower at least once every two years and for testing numbers to remain around 400 per year.

Chemical screening

The apple and pear program multi-residue screen is developed with APAL and the industry, taking into account Australian registered chemicals, chemical residue profiles and market sensitivities that are important for international trade.

The multi-residue screen includes fungicides, insecticides, herbicides and the scald inhibitor (diphenylamine). Heavy metal screening may be included in the future.

“From 1 July 2014, we will be using a new analytical screen that provides comprehensive coverage of chemicals registered for use in Australia, including those no longer registered, and those important for international trading partners,” said Chris.

“The number of compounds we now currently test is around 195, including metabolites.”

Market access

Samples can now be marked as ‘export’, noting the market destination to assess the sample against the importing country’s residue criteria. To help growers better plan any chemical applications for export fruit, NRS has launched a new International Maximum Residue Limit (MRL) database available on the Department’s website. This provides MRL information for a range of key export markets and market information that explains each country’s pesticide residue requirements.

“Each country has different import tolerances,” said Chris.

“Meeting Australian standards does not mean compliance with the export destination requirements.”

At the APAL Industry Summit, Chris noted that China and Hong Kong have released new pesticide import requirements, and that other Asian countries, including South Korea, Japan and Taiwan are following suit.

Communication

The NRS has released its annual brochure for apples and pears in 2013-14, which is available on the APAL website along with details of past surveys and the program more broadly.

“The brochure we develop to summarise NRS results can be used as a marketing tool with international fruit buyers to demonstrate our extensive chemical testing and the good results the industry has achieved,” said Chris.

“This year we will offer a language translation service for the NRS brochures to help international buyers understand more about our industry’s standards.”

The results also provide assurance to customers of the excellent residue and contaminant status of Australian pome fruit.

“
New tree registry project starts

In a new HAL-funded project, AgFirst is going to assist the industry capture data on varieties of apples and pears planted and their productivity.

Knowing what proportion of Australian orchards are already planted and being planted to different varieties of apples and pears and their productivity, will help growers and the industry better plan for the future. HAL has recently approved funding for the ‘Apple and pear industry data collection project’ (HAL project number AP13035) to capture data, create an online Tree Registry database and produce a robust industry crop estimate in 2015.

“Getting a grip on our basic tree data is fundamental to giving us the information we need to make decisions about the industry and take action to ensure its profitability long-term,” says John Dollisson, CEO of APAL.

“Participating growers will get the immediate benefit of being able to benchmark their own orchard statistics against other orchards both within their own state, and Australia-wide. “This will help growers know how their trees plantings compare to others and if their tree performance is in similar, better or worse shape than that of other growers. It may also help us discover where there might be a future under-supply or over-supply of different varieties.

“One we know this we can better plan for the marketing of our fresh fruit – both domestically and overseas – and the overall development of the industry.”

Building on existing data

The Australian Bureau of Statistics (ABS) used to conduct a broad survey on the industry that included production numbers and tree counts broken down by varieties, but the survey was cancelled after 2008 due to costs.

ABS’s current data publication on the industry through their Agricultural Commodities Survey is largely inadequate for any detailed supply-side analysis. The hope is that the Tree Registry project, with participation and inputs from growers, will help to paint a clearer picture of the productive capacity in the industry.

Online Tree Registry

The project will see the development of an online system for collection of industry tree data including tree plantings by variety and state called the Tree Registry. The Tree Registry is expected to be available in September 2014 on the APAL website (www.apal.org.au). The target is to get tree statistics for 90 per cent of the Australian planted orchard area entered into the Tree Registry. Captured statistics will include variety planted, area planted, tree density, tree age and root stock.

While grower participation will be voluntary, the success of the project relies on grower involvement. The project is paid for by growers through the apple and pear levies because it has been identified as of high importance to the industry and can provide valuable information for individual growers too. In particular it will be important that all large-scale growers participate because it is estimated that 70-80 per cent of the crop is produced by 10-20 per cent of growers in each region.

Growers will be offered assistance to enter data where it may be required.

Here to help

Most growers are already familiar with AgFirst who deliver APAL’s Future Orchards® program. New Zealand’s Ross Wilson from AgFirst, who was recently in Australia to present at the southern series of the Future Orchards’ walks, and Richard Pentreath, another of AgFirst’s horticultural experts in NZ, will manage the project. They will join forces with Jesse Reader, now with AgFirst in Australia, and a bunch of local consultants based in each growing region to facilitate the collection of data here.

The local consultants, people that you will likely already know from your growing region, will be available to help growers enter data to get a good representation of the industry. APAL’s role will be to support the project and facilitate broad communication with all growers about the project to encourage participation and use of the data.

Outputs

Richard explains that growers will able to print or download a summary report for their orchard tree statistics, which will be a useful reference document for planning and orchard development purposes.

“One once entered, it will be easy to update your statistics on an annual basis by accessing the online database,” says Richard. “After you enter your statistics, you will have the ability to easily compare your variety mix and tree age against both state and national averages.”
“Updating your tree stats annually should be part of your annual business plan, an accurate understanding of variety mix and tree age is essential for planning future development.”

Additionally, growers will be helping build a valuable and robust industry data set that will help develop the programmes needed to support future growth and development.

Other outputs of the project include a statistics annual including current plantings and production, the establishment of a grower panel to help generate industry crop estimates, an industry crop estimate for 2015 and, eventually, an industry mapping resource connected to the Tree Registry database.

Get involved

Once the Tree Registry is up online, it will be very easy to participate and enter data. Growers will just need to log onto the Tree Registry following the link provided and creating a password to access the site.

To prompt your involvement, all APAL grower members and apple and pear levy payers will be contacted by APAL to enter their own data. Growers who cannot enter data themselves for any reason can contact the local consultant and request assistance.

The contact details for local consultants will be provided in the email request or you can contact APAL anytime for help.

Richard explains, “When you receive your email request, please follow the simple instructions provided and enter your tree statistics after logging onto the Tree Registry.”

Only growers on the APAL database will be set-up in the Tree Registry so please provide APAL with your contact details if APAL does not already have your details.

Find out more

Stay tuned for the announcement of the launch of the Tree Registry via APAL’s Industry Juice e-newsletter. If you are not already getting Industry Juice subscribe now here: http://tinyurl.com/apalnews.

For more information on the project please contact Jesse Reader at jesse.reader@agfirst.co.nz or 0419 107 245.

This project is funded by apple and pear growers through the apple and pear levy administered by Horticulture Australia Ltd (HAL). It will be managed by AgFirst with the support of APAL.
The ‘Watts in Your Business’ project has completed energy audits of 30 packhouses and orchards Australia-wide, and shows how understanding tariffs in a packhouse/orchard can save money.

In Australia there are three types of organisations involved in providing energy:
- Generators produce electricity.
- Networks distribute electricity to customers and own and maintain the electricity network wires and poles.
- Retailers purchase electricity from the Networks and on sell it to customers.

**Your electricity rate**

Electricity Retailers calculate electricity billing rates based on the type of contract and/or the type of supply meter. There are four main categories of electricity tariffs (billing rates):

- **Single rate tariff:** used when a customer’s account is charged the same rate for the electricity regardless of the time of day or day of the week it is used or the quantity (also known as ‘flat rate tariffs’).
- **Block rate tariff:** used when a customer’s account is charged at different rates depending on the quantity used. For example, an account may pay $0.36/kWh for the first 1,500 kWh, $0.33/kWh for the next 1,000 kWh and $0.30/kWh thereafter.
- **Time-of-use (interval tariff):** used when a customer’s account is billed based on the time of electricity use. Often an account is charged peak rates during the day and off-peak rates during the night and on weekends.
- **Controlled load rates:** used for customer’s accounts with specific appliances, such as hot water heating, that can be controlled to use electricity during off-peak times when electricity demand is at the lowest.

**Tariff reduction techniques**

There are various techniques that can reduce a customer’s electricity bill, including:

- **Shift electricity use to lower tariff time**
  Load shifting involves shifting electricity usage to another time period, typically when tariffs are lower. This can be useful in reducing demand charges and/or usage charges. For example, if a site has peak/off-peak tariff pricing and the peak tariff is from 7:00am or 7:00pm, the customer can shift some of their electrical load (i.e. irrigation pumps or refrigeration compressors) to run from 7:00pm to 7:00am to take advantage of the lower off-peak tariff. In addition, if a customer’s peak demand consistently occurs during a specific time period, the customer can reduce this charge by shifting the electrical load away from the peak demand periods.

**Negotiate a good contract**

Tips for contract management:
- Ensure that you have all the relevant data available including site details, contact details, annual consumption data, existing rates and charges, and interval data.
- Lay out the information in a concise format.
- Investigate retailers that would be most appropriate for your energy consumption profile.
- Monitor energy markets to select the most appropriate time to go to tender.
- Prepare a report that accurately compares all the rates and charges on a like-for-like basis. Offers from various retailers will look different.
- Once the charges are assessed and the retailers’ terms and conditions appraised, choose a retailer.
- Upon contract, ensure that the selected retailer has nominated the site for transfer.
- Check first invoice for correct charges.
- Monitor consumption and expenditure on an ongoing basis.

**Top tips to cut energy costs:**

- Shift electricity use to a time period when tariffs are lower.
- Research the most suitable electricity retailer and contract that will best suit your business.
- Install power factor correction.
- Install a solar panel system.
- Use energy efficient equipment.
**Table 1: Types of tariff charges**

<table>
<thead>
<tr>
<th>Tariff Charge</th>
<th>Tariff Source</th>
<th>Tariff Explanation</th>
<th>National Average</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Usage (per kWh charges)</strong></td>
<td></td>
<td>These charges are based on the kWh use of electricity. Depending on the electricity contract, the charge can be a flat rate or broken into peak/off-peak and shoulder rates.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Retailer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|                         | Network       | These charges are based on the kWh use of electricity. Depending on the electricity contract, the charge can be a flat rate or broken into peak/off-peak and shoulder rates.  
Network, Retailer, and government charges are combined into one price on invoices at small sites and some irrigation meters. |                  |
|                         | Government    | These rates are federal and state environmental and market charges which fund various energy related programs. On bills they are often referred to as:  
Environmental Charges  
LRET – Large Renewable Energy Target  
SRES – Small-scale Renewable Energy Scheme  
These charges fund the programs which provide rebates for installation of solar PV systems.  
Australian Energy Market Operator (AEMO) Charges  
AEMO Ancillary  
AEMO Market  
Fees to AEMO are for market participation and ancillary services on customers behalf. These include activities undertaken to ensure safe and secure power delivery.  
State Environmental Charges  
VEET – Victorian energy Efficiency Target (VIC)  
ESS – Energy Saving Scheme (NSW)  
These are state funded programs to provide incentives for business to become more energy efficient.  
Network, Retailer and Government charges can be combined into one price on invoices at small sites and some irrigation meters. |                  |
| Fixed (per day/ month/year charges) | Retailer and/or Network | Often Retailer and Networks have various fixed charges that are applied over a time period rather than usage. On invoices they are often referred to as:  
Service charge  
Network Standing Charge  
Meter Charge  
Service Fee  
Cold Storage Facilities  
Peak: $0.27  
Shoulder: $0.23  
Off-peak: $0.13  
Irrigation Pumps  
Peak: $0.31  
Off-peak: $0.15 | $1,791 per annum  
$1,128 per annum |
| Demand (per kW or kVA charges) | Network       | Demand is the largest amount of electricity being consumed at any one point in time across an entire system. This charge is used to deter customers from consuming large demands of electricity at a single time from a network to prevent interruptions in supply across the entire network. Depending on a customer's site this charge can be per kW or per kVA. Depending on a customer's contract, this charge can be based on a 12 month rolling fee or on a month by month basis. | Cold Storage Facilities  
$13.53 kVA or KW |
Tips for using an energy consultant/broker

- Use an experienced energy consultant because they:
  - Monitor the energy market daily and are aware of market movements and can advise when is or isn’t a good time to contract.
  - Advise on contract terms and length of contract.
  - Tender to all relevant energy retailers giving you a number of comparative offers.
- Ensure the energy consultant will give you a ‘full circle’ level of service. They will not only guide you through the tender and procurement process but they will provide outstanding account management throughout the lifetime of your energy contract.
- Understand the other services they offer.
- Use forward contracting: you can lock in your energy contract for up to 3 years at today’s market rates, which can be very cost effective. It also helps with company budgeting and forecasting.
- Look out for any ‘hidden’ charges such as service charges, commissions and metering. Ensure that these charges are included in any comparison.

Install power factor correction

Power factor is the ratio of the active (or useable) power measured in kilowatts (kW), to the total (active and reactive) power measured in kilovolt amperes (kVA). The optimum power factor is a value of 1.0.

If a customer has a demand charge that is billed per kVA (not per kW), then Power Factor Correction (PFC) can be utilised to reduce the demand charge. The kVA demand is a function of the customer’s power factor and it impacts the ability of the site to achieve a lower demand charge.

Inductive loads (i.e. motors and fluorescent lighting) can cause poor power factor due to the difference between the voltage and current at the load terminals. Power Factor Correction capacitors act as a ‘reactive power generator’, providing the magnetizing power an inductive load requires to operate – rather than the motor having to draw it from the network. Therefore, improving power factor will reduce the amperage draw from the network, which will result in a reduced demand charge.

Set up a solar photovoltaic system

Installing a solar photovoltaic system can reduce electricity costs by generating electricity through solar panels to off-set the purchase of electricity from the network. It is possible to also reduce a customer’s demand charge by installing solar, however this is highly dependent on weather conditions.

Use energy efficient equipment

By upgrading aspects of the facility to be more energy efficient, a customer can reduce energy consumption and therefore associated costs. Common ways to reduce energy usage include:

- Upgrade to energy efficient lighting.
- Upgrade to energy efficient motors (irrigation and refrigeration).
- Install variable speed drives on evaporative fan motors and irrigation pump motors.
- Install automated cool room doors.
- Implement head pressure reduction or variable head pressure on the refrigeration system.
- Insulate hot and cool pipework.
- Reduce air compressor leaks.
- Install voltage power optimisations—generally only viable for a site that uses 500,000kWh or more a year.

Acknowledgement

‘Watts in Your Business’ is managed by APAL, undertaken with Summerfruit Australia Limited and Cherry Growers Australia Inc., and funded under the Australian Government’s Energy Efficiency Information Grants program. KMH Environmental have completed the audits and are preparing the reports with the assistance of Michael Bellstedt and Ananth Arkal of Minus 40, and Sam Birrell of Netafim.

About the author: Amanda Booth Environmental Consultant, KMH Environmental

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Getting the most out of chemical thinning

By Dr Sally Bound

Responses from chemical thinning can be unpredictable, making optimal management of crop load a difficult task. Here Dr Sally Bound helps navigate through the different options available to find a perfect match for your orchard.

Trying to juggle the different ways to manage crop load with unstable spring weather conditions is a fine balancing act. However, combining the following can help maximise fruit quality and pack-out while maintaining consistent yields:

- Dormant pruning to remove weak spurs and unbalanced limbs to open up the tree and reduce excess wood and bud load;
- Followed by the use of a structured chemical thinning program during flowering and the early post-bloom period; and
- A final tidy-up hand thin.

An understanding of the many interacting factors influencing fruit thinning will aid in developing a successful thinning program. To maximise the benefits of any thinning program, good overall tree management is important – the greatest benefits are achieved where good management of all aspects of fruit production are employed. For example, where an orchard is subjected to water stress or where nutrition is lacking, then thinning is unlikely to substantially increase fruit size or quality.

Early crop load management is important

Apple trees experience a natural ‘December’ drop, but this is insufficient to achieve optimum crop loads, fruit size and quality, or to prevent biennial bearing. Flowers for the following year are initiated during spring and trees carrying heavy crop loads over this period will have less flower buds the following spring. Hence to ensure regular bearing and optimise fruit quality we need to remove more than 90% of the potential fruitlets within 6 weeks of bloom.

The first 6 weeks after flowering is also when cell division occurs in the developing fruitlets, and maximising resources during this period of fruit growth will maximise both fruit size and internal quality. Leaving excess fruit on the tree during this period is a waste of the tree’s resources, as growth is put into fruit that is later removed. It is more productive to channel this energy into fruit that will remain on the tree through to harvest. This is particularly important in drought years when water resources are scarce.

The negative relationship between crop load and fruit size is well known, but high crop loads can also have a negative effect on fruit firmness (Figure 1) and sugar content (Figure 2). Hence strategies such as the use of substantial removal of flower buds during dormant pruning, and application of blossom thinners early in the flowering period, provide an excellent chance of maximising fruit quality, and thus returns to the grower.

Stages in the thinning program

1. Pruning

Pruning during the dormant period should be considered the first stage of any thinning program. Well sized, high quality fruit are associated with open, healthy trees.

In apples, the best fruit occurs on younger spurs (2-4 year old). Canopies need to be opened up and trees kept young by appropriate pruning so that older spurs are removed and fruiting occurs on young wood. Adequate light is also important for production of good quality fruit and initiation of strong flower buds – this is especially important in netted canopies. Heading back of limbs should be avoided as this tends to invigorate the tree, instead larger unbalanced branches should be removed completely. Aiming for 6-7 branches per metre of tree height will open up the tree, resulting in improved bud initiation and better fruit quality as well as better spray penetration and access for harvesting. Tying down upright branches will also help to calm trees.

The timing of pruning also has an effect on fruit quality. Tasmanian studies have shown that delaying dormant pruning until spring adversely affects fruit skin finish, sugar content and fruit shape. Summer pruning is a common practice in Australian orchards to remove the current season’s growth to prevent shading of the fruit and improve fruit colour. However, this practice reduces fruit size and sugar content and produces flatter fruit – probably due to reduced photosynthetic production resulting from the reduction in the leaf to fruit ratio caused by summer pruning.

2. Chemical thinning

A program combining both bloom and post-bloom chemical thinners will give the most reliable results. Remember that the chemical thinning program needs to start early in the flowering period using the chemical/s of your choice. We are fairly lucky in Australia with a choice of chemicals available. Registered blossom thinners are: ATS (ammonium thiosulphate), ethephon, and NAA. Lime sulphur is also effective as a blossom thinner. There are two post-bloom...
thiners registered in Australia: 6-benzyladenine and carbaryl/thiram.

Blossom thinning
Regardless of whether thinning is undertaken by hand or with the aid of chemical thinning agents, the thinning process should start early in the flowering period.

Ammonium thiosulphate (ATS): ATS works by burning the style and stigma of the flower, thus preventing pollination and fertilisation. While leaf damage does occur with descansits, 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: Time of application is critical in achieving a satisfactory level of thinning (Table 1). The chemical must be applied when sufficient flowers have already been fertilised to give a good crop load. Multiple applications are recommended. In cultivars with an extended flowering period, such as ‘Gala’, three applications may be necessary.

Spray volume: ATS should be applied at high volumes, ensuring thorough wetting of the trees. Ensure the sprayer is properly calibrated to give even coverage over the whole tree. Low volume concentrate spraying of desiccating chemicals is not advised as this is likely to result in an extreme desiccating action, causing severe burning of foliage and death of buds.

Ethephon: Ethephon can be a vigorous thinner, completely removing weak spurs or depleting fruit positioned low on the tree. Complete fruit removal: While ethephon thins effectively at around 40 dAFB (days after full bloom) it does not improve fruit size and can cause yellowing of the fruit at harvest. However, if the crop is damaged, eg. by hail, application at 40-50 dAFB can remove the damaged crop. This not only saves hand removal of the crop, but has a positive effect on return bloom.

Advantages: Improves return bloom.
Disadvantages: Ethephon has a tendency to flatten fruit. It can also depress fruit size if used at higher rates or too late. Ethephon is not effective in cooler temperature conditions.

NAA: While NAA can thin most cultivars between FB (full bloom) and 21 dAFB, the earlier it is applied the better the response in fruit size. NAA promotes vegetative growth that can be advantageous in green apples such as ‘Golden Delicious’ or ‘Granny Smith’, but can be a distinct disadvantage in red apples where extra vegetative growth shades the fruit, inhibiting red colour production.

Interactions: NAA interacts with other plant bioregulators containing the gibberellins GA4+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.

Post-bloom thinning
6-benzyladenine (BA): There are several products registered in Australia with the cytokinin 6-benzyladenine as the active ingredient [CyLex & Maxcel (Valent BioSciences), BAPSol (Gro-Chem NZ), Exilis (Fine Agrochemicals Limited)]. BA is a post-bloom thinner and works most effectively following treatment at flowering with one of the blossom thinners ATS, ethephon, or NAA.

Application conditions: BA is temperature dependent, the warmer the temperature the more effective it will be. Ideally it should be applied on a rising temperature curve, with maximum daily temperatures in excess of 15°C. Look for the best available weather during the recommended application period.

Advantages: If used correctly, BA is a consistent thinner. It is not persistent or toxic, and is OK for IPM programs. BA increases fruit size independently of the thinning effect and may also increase fruit firmness.

Disadvantages: Temperature dependent – needs warm to hot conditions.

Carbaryl/Thiram: Carbaryl is regarded as a mild thinner and usually only removes the slower growing fruit within bunches. In Australia carbaryl is used as a post-bloom thinner, normally in a tank mix with thiram. Carbaryl can also be used on trees where use of a primary thinner is not warranted, either because the trees are young or because of sparse blossom buds.
**Application conditions:** Carbaryl is temperature dependent, requiring warm dry conditions for effective thinning. The warmer the temperature the greater the thinning effect. Cool or damp conditions following application can result in fruit russet.

**Disadvantages:** Carbaryl is toxic to bees and beneficial species important in IPM programs. It is also toxic to mammals, and has been found in waterways. Carbaryl can leave residues on fruit, and its use is banned on fruit exported to some countries.

**Dormancy breakers**

As dormancy breakers often compress the flowering period, making thinning chemicals more effective, caution is advised with thinning chemicals when dormancy breakers such as Dormex® or Waiken™ have been applied. In this situation careful fruitlet counts should be undertaken after the application of primary thinners to determine whether further thinning is necessary. If using ATS, only one application may be required to reduce the crop load to a suitable level.

**Netted orchards**

Fruit set in trees under hail netting tends to be lower than uncovered trees. Due to the lower light levels, chemical thinning of netted trees often induces greater fruitlet drop, hence care should be taken to avoid over thinning. While low blossom trees under nets may not require the application of chemical thinners, trees with medium to heavy blossoms will still benefit from chemical thinning to minimise or eliminate the need for follow-up hand thinning.

**Benefits of chemical thinning**

All chemical thinners have some disadvantages, 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 quantities of chemical 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.

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

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**Table 1. Available chemical thinning agents and recommended concentrations and application times. Note FB is ‘full bloom’ and dAFB is ‘days after full bloom’.

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Concentration</th>
<th>Time of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS</td>
<td>0.75 – 1.5% v/v</td>
<td>20% and 80% bloom</td>
</tr>
<tr>
<td>ethephon</td>
<td>30-50 ppm for younger trees</td>
<td>Balloon blossom to 7 dAFB</td>
</tr>
<tr>
<td></td>
<td>100-150 ppm for mature trees</td>
<td></td>
</tr>
<tr>
<td>naphthalene acetic acid (NAA)</td>
<td>4-5 ppm for easy to thin cultivars up to 12 ppm for difficult to thin cultivars*</td>
<td>F8 to 5 dAFB</td>
</tr>
<tr>
<td>benzyladenine (BA)</td>
<td>150 ppm applied as a fine mist (9L/ha in 1200L/ha)</td>
<td>Fuji &amp; Gala 15-22 dAFB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Red Delicious 10-20 dAFB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Golden Delicious 10-20 dAFB</td>
</tr>
<tr>
<td>Lime sulphur</td>
<td>2% solution, applied to runoff</td>
<td>20% and 80% bloom</td>
</tr>
<tr>
<td>carbaryl</td>
<td>recommended label rate</td>
<td>14 – 60 dAFB Repeat at 7-10 day intervals as required</td>
</tr>
<tr>
<td>thiram</td>
<td>recommended label rate</td>
<td>As for carbaryl</td>
</tr>
</tbody>
</table>

*2 sequential sprays may be required - the 1st spray applied at FB and the second 3-5 dAFB.

---
surfactant such as Kendeen 20 will enhance the efficacy of ethephon, NAA and BA. Choice of thinning chemical is important as some cultivars do not respond well to some chemicals. The currently recommended chemical/cultivar combinations are shown in Table 2.

Economics of thinning

Economics strongly favour an aggressive thinning approach based on knowledge and records. Under-thinning is costly, resulting in small fruit size, poor fruit quality, extensive hand thinning and inadequate flower bud initiation for next year. Over-thinning is not a common occurrence, even with an aggressive approach, and even if it does occur there will be no hand thinning expenses, fruit quality is normally high and return bloom the next year is assured. Under-thinning has no such bonuses!

There is no simple answer to the question “How do I thin my crop?”. The two most important factors are application timing and ensuring that conditions are suitable for the particular chemical at time of spray application. Discuss possible strategies with your neighbours and local grower group. If you have a program that works, stick to it!

Future directions – a new tool to replace chemical thinning

Crop load management is the single most important practice determining the annual profitability of apple orchards, yet it is the most difficult. While our knowledge of chemical thinning and tree response has come a long way over the last 25 years, using chemicals to control crop load will always remain unpredictable. Hence we need to look for other ways to manage crop load. As early as 1995, Pierre-Eric Lauri and his research group studied the difference between regular and biennial bearing cultivars, and observed that regular bearers have high natural spur extinction. The New Zealand research group led by Dr Stuart Tustin has followed up on these studies and further developed the concept of Artificial Spur Extinction for management of crop load (see ‘Artificial spur extinction – a new crop management tool’, Australian Fruitgrower, June 2014).

As part of the national HAL-funded PIPS (Productivity, Irrigation, Pests and Soils) Tree Structure program, field trials duplicated in Tasmania, Victoria and Queensland have been comparing the impact of Artificial Spur Extinction with conventional pruning management on fruit set response, yield and fruit quality. The project team is in the process of summarising the data from this exciting project. However, results indicate the potential of Artificial Spur Extinction to supersede and eliminate the present requirements for chemical thinning to regulate biennial bearing and crop loading. This exciting work is likely to result in a shift in contemporary orchard system production approaches and technologies.

About the author:
Dr Sally Bound is a Senior Research Fellow at the Perennial Horticulture Centre, Tasmanian Institute of Agriculture, University of Tasmania.

Table 2. Recommended chemical/cultivar combinations.

<table>
<thead>
<tr>
<th></th>
<th>Delicious</th>
<th>Golden Delicious</th>
<th>Fuji</th>
<th>Granny Smith</th>
<th>Gala</th>
<th>Pink Lady™</th>
<th>Sun-downer</th>
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Workshops set scene for on-farm fruit fly management

By Angus Crawford

APAL’s Technical Manager Angus Crawford outlines how the practice of Area Wide Management can be used to manage fruit fly numbers

Despite great efforts fighting them off since 2011/12, Queensland Fruit Fly (QFF) has crossed the Murray River becoming a newly established pest in parts of Victoria. APAL, in partnership with HAL, the Department of Environment and Primary Industries, Victoria (DEPI), and IK Caldwell hosted a workshop on managing fruit fly in orchards for around 100 people. Similar workshops were also held for growers in Orange (NSW) and Loxton (SA) with local partners.

QFF in Victoria

QFF is now commonly detected in northern Victorian orchards and fenthion, a key chemical used to control the pest, may soon be banned. Growers therefore need to adopt and refine existing strategies such as Area Wide Management (AWM), which was the focus of the workshop.

Area Wide Management

Area Wide Management involves trapping, protein baiting, orchard hygiene, male annihilation technique, cover spraying and scouting. These measures can cost $250 to $300/hectare, excluding application costs and labour. This extra cost is one of the major impediments to seriously addressing fruit fly on orchards. However, there could be cost benefits resulting from the enforced reduction in the use of fruit fly pesticides.

The advantages of orchardists adopting Area Wide Management is that the populations will be lowered to an economically low threshold. This situation will be ideal when, in about five years, a Sterile Insect Technique (SIT) program for QFF can be rolled out to reduce these populations even further, perhaps to eradication.

Current CSIRO research is developing a new method of producing SIT insects using RNA interference (RNAi), which will disrupt the mating of fruit flies in the field. Essentially the fruit fly maggots consume food containing a molecule that turns off certain genes of the fruit fly so that they turn male and become sterile. RNAi is better at sterilising fruit flies than irradiation as RNAi flies are potentially more effective at finding a female.

Trapping

Traps are used to determine populations of fruit flies in an orchard. Using the most effective traps helps to most accurately determine if you have a fruit fly problem or not. Regular monitoring should be maintained and it is especially important to include any zero readings.

There are lots of traps available which catch fruit fly to varying levels, with yellow traps proving more attractive to the fruit flies than green, red or blue traps. Traps may be placed at 2 traps per hectare usually on the eastern part of the tree to avoid intense afternoon sunlight. Traps contain a wick impregnated with a male sex attractant and insecticide.

Bait spraying and Male Annihilation Technology

To minimise the chance of catching any fruit flies apply bait sprays and male annihilation technology early.

Bait spraying is done weekly to attract and kill male and female fruit flies. The bait contains a protein attractant that is laced with insecticide. It is applied using a jet stream nozzle aimed at the trunk or foliage of the tree on every second row. Growers often set up their ATVs for this purpose as the jet stream means only low water volumes are needed and application over an orchard is very fast.

Male Annihilation Technology (MAT) must be used in conjunction with bait spraying but requires less frequent application. MAT products are pheromone based so they attract males to a small credit card-sized pad containing insecticide. AmuletCL® is one of several such lure/toxicant products that is available and is commonly recommended at 16 pads per hectare and it lasts about 3 months before needing replacement.

In theory, on an isolated orchard the recommended application of 6-8 weeks before maturity of baiting and MAT would be mostly fine. However, most orchards have a mixture of other earlier varieties and maybe close to a township where there may be no fruit fly management. Therefore, external factors regarding what is happening around the area need to be taken into consideration. If in doubt, a good general start date would be between 1 September and 1 October of each year.

Good orchard hygiene

Good orchard hygiene is always a recommended part of all good IPM systems, but for fruit fly it is essential. Good hygiene includes mulching or removing remaining fruit, which stops fruit fly easily carrying over to the next season. Bad hygiene is exhibited...
in towns which act both as a host as well as heat islands for fruit fly posing serious additional pressure on surrounding orchards. All home gardeners are strongly urged to help minimise this and go to a hardware store or local agricultural chemical supplier and purchase a fruit fly product.

**Cold treatment**

Many of our export markets require mainland fruit to be cold treated at a set temperature for a specific number of days in order to kill any potential fruit flies. Quarantine treatment research to determine the effectiveness of cold treatment of apples, pears and nashi against QFF shows that there is no difference in efficacy between 1±0.5°C and 3±0.5°C treatments and that cold treatment for 12 days at ≤ 3±0.5°C effectively controls QFF. Interstate certification assurance protocols are managed by state and territory bodies and demonstrate that the correct procedures have been taken to meet interstate plant quarantine requirements. The Manual of Importing Country Requirements (MICoR) is a useful resource containing information on the requirements of importing countries.

**Everyone’s problem**

Fruit growers are urged to increase efforts towards controlling fruit fly which will involve adopting Area Wide Management. The current QFF problem is significant for production and marketing and needs growers and the rest of the community to be fruit fly savvy all year round – not just at harvest time. I encourage growers to get involved and ensure your neighbours and wider community are involved too.

If towns and urban fruit growers continue to do nothing to control QFF in abandoned orchards and backyard trees, QFF pressure will increase even further. Local grower groups are encouraged to work with their local councils to help educate residential communities about how to manage their gardens against fruit fly.

APAL would like to thank Professor Eric Jang (USDA), Andrew Jessup (NSW DPI), Cameron Forrest and Sam Beggs (IK Caldwell) for presenting at the workshop. Also orchardists Doug Brown, Andrew Plunkett and Jason Shields who gave detailed accounts on how they manage fruit fly in their operations was invaluable.

Angus Crawford | t: (03) 9329 3511 | e: acrawford@apal.org.au

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Trends in carbon stocks in apple orchards

By Roberta Gentile, Brent Clothier, Carlo van den Dijssel, Karen Mason, Andrew McLachlan, Dave Cornwall, Marcus Hardie and Justin Direen

Understanding what causes changes in soil carbon stocks can help with the development of management techniques to improve carbon stocks for a healthier soil.

There are two reasons for maintaining or increasing soil carbon stocks in orchards. Firstly, soil carbon helps to sustain soil functions. It is a key driver of soil aeration, water-holding capacity, nutrient cycling and disease suppression. In our previous article ‘Soil carbon and soil health in apple orchards’ (Australian Fruitgrower, July 2014) we showed how soil carbon was important for driving the mineralisation of plant-available nitrogen in the rootzone.

The second reason increasing soil carbon is important is because there is growing interest in storing carbon in the soil to reduce carbon emissions in the atmosphere and mitigate climate change. In the future, growers could be paid for soil carbon sequestration. Australia’s Carbon Farming Initiative is one example of this. Through new management practices, it seeks to “…allow farmers and land managers to earn carbon credits by storing carbon or reducing greenhouse gas emissions on the land.”

A key aim of the Soils team of the Productivity, Irrigation, Pests and Soils (PIPS) program is to determine any changes in soil carbon in Australian orchards and to quantify them. We also aim to provide guidance on how soil carbon might be better managed to maintain or increase soil carbon stocks.

Change in orchard soil carbon stocks

We selected two orchard blocks near Shepparton, Victoria, and one block near Huonville, Tasmania, to sample in detail for soil carbon stocks down to 1 m depth. We first collected soil samples in December 2009 and this was repeated in October 2013 to measure the change in soil carbon after four years of current orchard management practices.

From our paired samplings four years apart, we have not found any change in total soil carbon stocks down to 1 m in these three orchards. This means that in total the orchards were neither losing nor gaining soil carbon at this scale. The average soil carbon stocks to 1 m depth were 6.4 kg C per square metre near Shepparton and 11.7 kg C per square metre at Huonville.

In total this can be seen as a positive because under these orchards soil carbon stocks appear to be stable, unlike, for example, in arable farming, where tillage practices are leading to losses in soil carbon.

However, in all three orchards, we identified that surface-soil carbon stocks (0-20 cm) are trending downwards, with the changes observed being significant in two of the orchards. Conversely, subsurface soil carbon stocks (20-50 cm) were found to be trending upwards, suggesting a downwards movement of soil carbon.
Increase carbon inputs

Carbon inputs may be increased by adding organic amendments, such as compost. In a New Zealand apple orchard, annual compost inputs at 5-10 t per year led to a 1.2 kg C per square metre difference in carbon in the top 30 cm compared with that in a neighbouring orchard that did not use compost (Deurer et al. 2008). This change in soil carbon stock also benefited orchard soil health (Deurer et al. 2008; 2009).

Another means to increase orchard soil carbon, especially in the alley, would be to plant different plant species between the rows. Deeper rooting plants and plants with higher productivity could be used to increase carbon inputs into the soil of the alley. Care would need to be exercised with this, for such alley plants might have higher water use, and thereby have negative consequences for irrigation management.

Distribute carbon inputs

Our results here suggest that the greatest losses of surface soil carbon are occurring in the alley. One option therefore is to ensure a better distribution of carbon inputs from mowing and prunings across the row and alley. Such an approach could also include management where carbon inputs to the orchard are increased.

Figure 1: Soil carbon stock in the alley and tree row sampling positions at surface sampling depths at three apple orchards sampled in 2009 and 2013. Error bars are the least significant difference for comparison.

Guidelines for soil organic matter management

The observed decline in orchard soil carbon may be an unforeseen consequence of the high efficiency of apple tree management. Nowadays, a very high harvest index for fruit production has been achieved. Palmer et al. (2002) found that in terms of dry matter production, the harvest index of modern production systems is between 65 and 75 per cent. So most of the carbon captured by the tree is transferred to the fruit and then exported from the orchard as apples. Thus, there are reduced carbon inputs to the soil through roots, leaf drop, and prunings. Soil carbon inputs do not appear to be matching topsoil carbon losses in the alley in particular.

Management options to change this trend include increasing carbon inputs into orchards, better distributing carbon inputs to the soil, and reducing soil-carbon losses.
Reduce carbon losses

Orchard redevelopment often involves uprooting of the existing trees and burning them. This burning of the tree and disruption of the root system sends carbon to the atmosphere, and triggers soil respiration that decreases soil carbon stocks. Orchard redevelopment using top-grafting of new cultivars onto the existing rootstocks would serve to preserve more of the soil’s carbon stocks.

Many orchards in the survey across Australia have re-contoured rows and alleys. During orchard redevelopment, the top soil from the alley is moved to form a mound along the row. This tillage and soil disturbance process would increase soil respiration and result in net orchard losses of soil carbon. Indeed, the losses of carbon we have observed in the alley might even be a legacy of changes brought about by the earlier orchard contouring.

Conclusions

Our results suggest that surface soil carbon stocks in orchards are declining. Since soil organic matter is the driver of many soil functions, it is a key determinant of soil health, and we consider it important that soil carbon stocks be maintained, or better still, enhanced. This could be achieved through increasing carbon inputs into orchards, better distributing carbon inputs to the soil, and reducing soil carbon losses.

Acknowledgements

We thank Maurice Silverstein and Howard Hansen for their cooperation with this research. This project was conducted as part of the apple and pear industry Productivity Irrigation Pests and Soils (PIPS) flagship programme, funded by HAL using the apple and pear industry levy and voluntary contributions from the Institute for New Zealand Plant & Food Research Limited, and matched funds from the Australian Government.

References


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Bud burst in ‘Williams’ pears highly variable

By Marco Calderon

**Bud burst in ‘Williams’ pears is highly variable, leading researchers to look deeper for the causes to find management strategies that support an even bud burst and even maturity of fruit for harvest.**

Evenly matured fruit at harvest time makes picking easier and cheaper. If fruit matures at different times it can mean that growers have to pick at multiple times, which can add to costs and reduce profitability.

Finding out why fruit matures at different times is the first step in identifying strategies that encourage an even harvest. One key factor that affects when fruit matures is when a fruit tree first starts to flower or when ‘bud burst’ occurs.

**Bud burst timing**

Bud burst timing in pome fruit trees is dependent on local environmental conditions, especially temperature, and may be influenced by bud type.

We examined the variability in the day-of-year when ‘Williams’ pear buds reached the bud burst phase. We recorded when budburst occurred in ‘Williams’ pears grown in Applethorpe (QLD) in 2012 and 2013 for three types of buds: terminal, axillary and spurs (Figure 1).

Using the dates when the individual buds reached the bud burst stage it was possible to determine the beginning and length of the bud burst phase and the differences in variability between bud types and years. The progression of bud development was recorded three times per week from dormancy to full bloom. Bud burst data of 30 buds, 10 of each type (located throughout the canopy an all sides the tree), were recorded per tree for five trees. There was no axillary data recorded for 2013.

**Great variability in bud burst timing**

The results show that on average terminal and spur buds were the first buds to reach the bud burst stage in both years, whereas axillary buds were the last to reach this phase almost 15 days later than terminal buds (Table 1). In terms of variability, the difference

<table>
<thead>
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<th>Year</th>
<th>Number of buds</th>
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<th>Last day-of-year to reach bud burst</th>
<th>Length between first and last buds to reach bud burst (days)</th>
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<td>2012</td>
<td>50</td>
<td>6 Oct</td>
<td>14 Sep</td>
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<td>50</td>
<td>2 Oct</td>
<td>14 Sep</td>
<td>19 Oct</td>
<td>35</td>
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<tr>
<td>Difference</td>
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<td>13 days</td>
<td>13 days</td>
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<td>50</td>
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<tr>
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<td>4 Sep</td>
<td>4 Oct</td>
<td>30</td>
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<td>3 days</td>
<td>11 days</td>
<td>7 days</td>
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Table 1. Summary of the results of day-of-year to reach bud burst for each type of bud for 2012 and 2013.
between the day-of-year when the first and the last bud reach bud burst is bigger in spur buds, 35 days, followed by axillary buds, 31 days, and terminal buds, 26–30 days. The results also show that bud burst was reached earlier in 2013 than in 2012. Spur buds showed the largest advance, around 13 days earlier than in 2012.

The main finding is the great variability in bud burst timing (26–35 days). This variability found for all three types of assessed buds may flow on to variability in fruit maturity at harvesting time.

Next steps

The focus of this project is to understand the factors influencing the variability and the differences in beginning of flowering. The next steps in the research include:

1. Analyse the influence of temperature on flowering timing.
2. Determine what conditions influenced early bud burst in the spur and terminal buds in 2013 compared to 2012.
3. Assess the variability of flowering timing of individual buds in ‘Cripps Pink’ and ‘Granny Smith’ apples and ‘Williams’ pears.
4. Use datasets from Victoria and Western Australia to investigate the differences in bud burst variability across Australia.

Acknowledgements

This project, ‘Orcharding the Future: The influence of temperature on Australian pome fruit flowering’, is funded by HAL using the apple and pear industry levy and matched funds from the Australian Government.

About the authors: Marco Calderon is a Masters student at the University of Melbourne working with Heidi Parkes (Department of Agriculture, Fisheries and Forestry, Queensland) and Rebecca Darbyshire (University of Melbourne).

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International apple and pear research update

Compiled by Dr Gordon Brown

Research snippets are sourced from abstracts of published scientific papers collated in the CAB direct database. To get the abstract related to any snippet please contact Gordon Brown on gordon@scientifichorticulture.com.au or 03 6239 6411.

Nurseries and New Varieties

Japan
The genome of a giant fruited mutant of La France pears was studied and while 26 activated genes were identified these could not explain the large fruit size.

China
It has been found that columnar apple trees have low levels of gibberellins in the shoot tip and the transcription of MdKAO, a gene involved in gibberellin synthesis is reduced.

Bosnia-Herzegovina
33 pear cultivars from different growing regions were collected and compared with Williams pears and all were found to have market potential.

Romania
Newly released disease resistant apples Redix, Iris, Remar, Inedit, Voincel, Real and Irisem were assessed over three seasons and all had black spot resistance and improved powdery mildew resistance.

Production

China
Bagging fruit reduces fruit sugars by reducing foliar calcium and potassium however foliar fertiliser applications during fruit set counteract the effects of fruit bagging.

Brazil
A microscope study of the leaf abscission layer development has identified the abscission layer starts to develop at harvest for Gala and Fuji.

Postharvest

New Zealand
Ethylene induced apple softening is a time-by-concentration relationship such that a softening due to low levels of ethylene is possible after an extended period of exposure.

Pests and Diseases

Romania
A preliminary survey of one growing region has identified 100% of apple trees infected with apple proliferation caused by Candidatus Phytoplasma mali.

Indonesia
Fungi, antagonistic to apple pathogens, were isolated from apples from the apple region of Indonesia and identified as Trichoderma asperellin, Trichoderma harzianum and Aspergillus flavus.

United States of America
Adults of Halyomorpha halys (stink bugs) that have overwintered are more sensitive to insecticides compared to second and third generation adults present in mid to late summer.

Argentina
After 6 years of no fertiliser in an apple orchard it was found that the number of bacteria consuming nematodes increased after applying ammonium nitrate to the soil.

Mexico
The powdery mildew susceptibility of 38 apple cultivars were tested in the Queretaro region and ‘Lourdes’ was found to be resistant, ‘Rayada’ very susceptible and ‘Gala’ was in between.

New Zealand
Sensitivity testing of Typhlodromus pyri to pesticides found that aminocarb, amitraz, benomyl, binapacryl, chlordimeform, ethion, omethoate, oxamyl, permethrin, pirimiphos-methyl and triazophos are toxic to the predator.

South Korea
Fuji apples were stored, 0°C, for 8 months under CA (2.5:1.5% O2:CO2) followed by air and it was found that internal browning occurred if stored under CA for longer than 5 months.
Greg’s Quiz

**QUESTION 1:**
(True or False) – During summer, European Red Mite will most likely be found sheltering on the bottom side of fruit tree leaves.

**QUESTION 2:**
In what year was the apple genome “decoded”?  
B: 2008.  
C: 2010.  
D: 2012.

**QUESTION 3:**
The US measurement of a “peck” is a portion of the bushel measure. How many pecks would make up a bushel?  
A: Four.  
B: Eight.  
C: Three.  
D: Ten.

**QUESTION 4:**
Found in high concentration in pears the compound non-soluble polysaccharide (NSP) provides what health benefit?  
A: As an easily digested sugar.  
B: As a dietary fibre.  
C: As an antioxidant.  
D: As a vitamin.

**QUESTION 5:**
What proportion of deciduous tree fruit production in the world is made up of apples?  
A: 25%.  
B: 35%.  
C: 50%.  
D: 65%.

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**APFIP are undergoing an upgrade of its weather stations, above is the new reporting format displaying new data collected from the first 3 station upgrades. This Data is from the APFIP evaluation Sites only and may not be representative of the total District. Chill unit data is recorded from 15th May to 15th of August and reported as per month and as a running total for the period, chilling units are calculated for the season immediately following collection of data.**

*This project was facilitated by HAL in partnership with Apple & Pear Australia Limited and is funded by the apple and pear levy. The Australian Government provides matching funding for HAL’s R&D activities.*
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