

# fruitgrower

A U S T R A L I A N

VOL 5/ISSUE NO.4  
MAY 2011

[www.apal.org.au](http://www.apal.org.au)  
[www.summerfruit.com.au](http://www.summerfruit.com.au)

## New Velvetine™ pear – 'luxury' texture



Designing a reliable test planting  
Growing your market: Vigour management

THE OFFICIAL MAGAZINE FOR APPLE, PEAR AND SUMMERFRUIT GROWERS IN AUSTRALIA

# fruitgrower

## Australian Fruitgrower

Australian Apple and Pear Ltd (APAL) and Summerfruit Australia Ltd (SAL) are the peak industry bodies representing the interests of commercial apple, pear and Summerfruit growers in Australia in matters of national importance including regulation, legislation, marketing, research and development.

*Australian Fruitgrower* will be published monthly, except for combined issues in December-January, to bring industry news to orchardists in Australia.

### Publishers

Apple and Pear Australia Ltd  
39 O'Connell Street  
North Melbourne VIC 3051  
t: (03) 9329 3511  
f: (03) 9329 3522  
e: cm@apal.org.au  
w: www.apal.org.au

Summerfruit Australia Ltd  
8/452 Swift St Auburn NSW 2640  
t: 02 6041 6641  
m: 0419 305 901  
e: ceo@summerfruit.com.au

Produced for APAL by KonzeptVZ

### Editor

John Fitzsimmons DipAgSci  
m: 0418 552541  
e: editor@apal.org.au

**Chair, Editorial Committee**  
Stuart Gray, Communications  
Manager, APAL

### Technical Editors

Dr Gordon Brown  
t: (03) 6239 6411  
gordon@scientifichorticulture.com.au

Dr Barry McGlasson  
University of Western Sydney  
t: 02 4570 1318  
e: B.McGlasson@uws.edu.au

### Advertising

The publishers accept no responsibility for the contents of advertisements. All advertisements are accepted in good faith and the liability of advertising content is the responsibility of the advertiser.

Enquiries: Hyde Media  
t: (03) 9870 4161  
e: max@hydemedia.com.au

### Annual Subscription

Australia: \$110 (including gst)  
Overseas: AUD \$159

Contact: John Fitzsimmons  
m: 0418 552541  
e: editor@apal.org.au

### Editorial

Opinions expressed are not necessarily those of the publisher.

### Copyright

All material in *Australian Fruitgrower* is copyright. NO material may be reproduced in whole or in part without the permission of the publisher. While every effort is made to ensure the accuracy of contents, APAL and KonzeptVZ accept no liability for the information.

### Contributions

All editorial enquiries regarding contributions should be addressed to the editor. Articles, letters, notes, etc, from any apple and pear growers are welcome. Contributions are preferred as MS Word documents delivered by email as a separate attachment. Photos, maps, etc, should be submitted as separate files and saved as either a TIF, PDF or JPG at a resolution greater than 300 dpi. The editor reserves the right to reject, revise and change text editorially.

### Photographs

Cover photograph submissions should preferably be digital taken at a resolution greater than 300 dpi. Web resolution images and colour prints (unless exceptional) are not of sufficient quality for full colour printing. Colour transparencies are also acceptable.

ISSN 1447-5618

## Editorial

2011 continues to be a most challenging year. There are challenges in the orchards – especially for Murray Valley summerfruit growers post-floods. And there are challenges from increasing competition and exchange rate issues in markets both domestic and export combined with economic and political winds blowing in various directions. There is the old adage that "You can't control the wind but you can set your own sail"; again we need to remind ourselves of that option which, nevertheless, requires that we have a preferred goal in mind. Strategy and planning are implicit in that statement – as individual enterprises and as industries.

Again, in this issue of *Australian Fruitgrower*, AgFirst's John Wilton looks to the future and "growing your market", now under the umbrella 'Future Orchards – Beyond 2012'. This time he considers tree vigour and, coincidentally, opens with the comment "Apart from the market itself, managing tree vigour is the greatest juggling game on the orchard." How true.

And, as the fruit comes off the trees, Dr Gordon Brown, Technical Editor – Apple and Pear, presents yet another option in the marketing mix – fruit wines and ciders. Don't confuse these with fruit liqueurs, and discover how fruit selection is as important as fermentation techniques, but there is real potential for some growers here.

Meanwhile our Technical Editor – Summerfruit, Prof. Barry McGlasson, has submitted a major roundup of recent summerfruit R&D from around the world for this, the last issue brought to growers by Apple and Pear Australia Ltd and Summerfruit Australia Limited combined.

In future SAL will communicate with growers via another channel in line with its goals and resources. APAL will continue to deliver to Australian fruit growers and allied industry people the high level of technical information and industry reporting that has been well established in Australian Fruitgrower magazine

Cheers

**John Fitzsimmons**



Dr Barry McGlasson  
Technical Editor SAL



Know-how for Horticulture™



This publication was facilitated by HAL in partnership with Apple and Pear Australia Limited (APAL) and Summerfruit Australia Limited (SAL), and it was funded by the apple and pear and summerfruit levies. The Australian Government provides matched funding for all HAL's R&D activities.

Edition 2011	Booking deadline	Editorial copy deadline	Ad material deadline
June No. 5	6th May	13th May	30th May
July No. 6	7th June	14th June	4th July
August No. 7	5th July	12th July	1st August
September No. 8	5th August	15th August	5th September

## table of contents

Editorial .....	2
APAL Chair's report .....	3
Summerfruit CEO's report .....	4
APFIP report .....	5

### NEWS

APAL news.....	6
State roundup .....	8
Weather, Greg's Quiz and industry information .....	27

### IN THE ORCHARD

Growing your market:	
Managing tree vigour.....	12

### SPECIAL REPORTS

Designing a reliable test planting .....	15
Value adding – how to make fruit wines and cider .....	20

### RESEARCH NOTES

International summerfruit R&D .....	18
International apple and pear R&D .....	24

### Our cover:

*Plums being infected by Queensland fruit fly in a laboratory.*





*Darrel Ashton*



## APAL Chair's Report

*They just don't get it!*

There are occasions that you just cannot help but think that some Australian politicians are either poorly advised or they do not look at the whole picture.

On 12 April last the Minister for Trade, Dr Craig Emerson, released a paper on Australian government trade policy titled '*Trading our way to more jobs and prosperity*'. This document is 21 pages in length and contains the usual government jargon about developing trade. However at the bottom of page 13 there is a paragraph that got me a little excited. It is reprinted below:

*The Gillard Government's decision to accept a World Trade Organization ruling on the importation of apples from New Zealand is testimony to its commitment not to use quarantine as an artificial trade barrier. The entry into Australia from January 2011 of apples from China is a further case in point. These decisions send a clear message to our trading partners that the Gillard Government is committed to a science-based quarantine regime that does not create artificial barriers to trade.*

We are all aware of our Prime Minister grand-standing in the New Zealand parliament earlier this year when she made her announcement regarding the WTO and the entry of New Zealand apples into Australia. Personally I believe that Julia Gillard delivered an insult to the Australian apple and pear industry with her announcement, particularly when we are aware that Biosecurity Australia still has some work to do to comply with the WTO findings, and that the revised protocols regarding fire blight, European canker and leaf curling midge will be released in early May for the 60 day period for stakeholder comment.

The message from Minister Emerson is also disturbing and highlights that he is unaware of the industry concerns regarding pests and diseases that we don't have and don't want. These issues are also of concern when we look at what is happening with some biosecurity issues in other industries. The Asian honeybee incursion in Northern Queensland raises a lot of issues for the bee industry that I won't go into except to suggest there is a link between Asian honeybees and Varroa mite. It was suggested to me that I should read *Fruitless Fall*, a book by Rowan Jacobsen that is an account

of the Colony Collapse Disorder issue that confronted American beekeepers in 2006-07. The big concern is that Asian honeybees are a vector for Varroa mite that can devastate hives and the only two places in the world without Varroa are Hawaii and Australia.

Of course another biosecurity issue that should be of concern has been the discovery and establishment of Myrtle Rust which was found in a nursery on the Central Coast of NSW and, despite efforts to contain it, it has now spread to the rainforest in the Gold Coast hinterland. It appears that it cannot be eradicated and management is the only option even though it is now loose in our native environment.

Finally we have had the discovery of Chestnut Blight in north-eastern Victoria. Again no one is aware of how this disease made it into the country however it has led to the removal of a great number of chestnut trees. The impact that will have not only on the nut industry - but also more particularly on the growers - involved is still unknown, however it can only make life more difficult for them when they have lost their income stream.

So, to come back to my main concern - and that is that politicians who have no idea of the personal and financial impact that an incursion of an exotic pest or disease can have on a family and a community - continue to make statements that highlights their lack of knowledge or concern.



Stuart Gray (second from left) with Madam Zheng Huimin (left), Deputy Director of the China Entry-Exit Inspection and Quarantine Association (CIQA) and Mr Duan Xiaohong (third from left), Deputy Secretary-General CIQA, and other delegation members.



APAL Chair Darrel Ashton with Madam Zheng Huimin (second from left), Deputy Director of the China Entry-Exit Inspection and Quarantine Association (CIQA).

If both Prime Minister Gillard and Trade Minister Emerson had witnessed orchards overseas that had been devastated by a fire blight outbreak, I am sure that they would end up with quite a different view of biosecurity and quarantine and maybe understand that it is not an artificial trade barrier.

### Visit by Chinese authorities

Elsewhere in this issue of *Australian Fruitgrower* there is an account of the visit to Australia by personnel from CIQA - the Chinese quarantine authority. They visited the Swan Hill - Mildura region looking at citrus, table grapes and summerfruit. Then they went to Tasmania to look at cherries and apples prior to attending a forum where numerous presentations were made by all of the Australian industries involved along with Biosecurity Australia.

There were also several presentations made by the Chinese authorities outlining their quarantine protocols and the background to their respective industries. The main thrust in the apple and pear presentation was to continue to push for early access for mainland apples into China. ■



## For the times they are a-changin'

There has been a lot of emphasis on chemicals lately and a significant forum was attended by industry representatives from Queensland, West Australia, New South Wales and myself. The dimethoate and fenthion label use workshop was facilitated by the Domestic Quarantine and Market Access working group.

As previously mentioned in earlier editions of *Australian Fruitgrower*, this review was focused on the acute reference dose - or exposure to the product over a 24 hour period through handling or consuming food. Edible peel fruits will face scrutiny and thus current in-field and postharvest usages may change.

The APVMA is still some time away from releasing a draft review outcome, however. 'back of the envelope' assumptions may see a result of no dimethoate usage and a modified withholding period (WHP) for fenthion -14 days for nectarines and plums. Peaches may be 21 days and with not much data available; I suspect apricots to be similar.

Currently trichlorfon is registered for control of Queensland fruit fly and Mediterranean fruit fly but this chemical is the next cab off the rank for review along with another 30-odd chemicals. Farming just gets more difficult and with the government talking up food security, it's hard to see where any security is assured with the producers' tool box diminishing. Industry has applied for Delegate™ (spinetoram) to be registered for use, (with a) three-day WHP, and between the combination, life may be half liveable but nowhere the ideal outcome.

I must stress these 'back of envelope' calculations are still to be confirmed and we need to wait for the official report to be released and I do not want to raise false hopes in any way. Another review is currently underway and

in typical bureaucratic fashion the industry consultative period has been short. This is a national scheme for assessment, registration and control of use, agricultural and veterinary chemicals. SAL and many other industries expressed concerns at the user pays model proposed. At a combined industry meeting with the Federal Minister for Agriculture, Fisheries and Forestry, Sen. Joe Ludwig, on 14 April this was raised; thankfully he did offer that he would consider a period of extension for consultation in the process prior to any final decision.

Another hot topic this month was the crucial workshop to debate on 19 April - the spray drift review. A recommendation by the APVMA is that a 300 metre buffer zone be set for future agricultural/horticultural best practice. There has been a working committee set up to see how industries can work with this proposal. A Queensland University study came up with this suggestion of a downwind 300 metre zone through wind tunnel testing. More details in later newsletters.

An increasing number of producing regions are tackling authorities about fruit bat controls and regulations imposed which prevent effective outcomes for affected producers; this is becoming another major headache and will be survival headlines in the future. It has been reported in the media that a class action has commenced in Queensland to overturn legislation. It is an anomaly - or even ludicrous - that we can cull and eat our national emblem and here we are

protecting bats that decimate people's livelihoods and impact on the environment. The plum verification trials for efficacy of cold disinfestations of Queensland fruit fly have been completed and it is now up to BAPHIQ to approve the trial's success. The Taiwan inspector was satisfied with the project's performance. Certainly from industry's viewpoint the trial was a success and I see no reason for any rejection. It would be fantastic if we have access for plums next season to Taiwan.

Finally, the SAL Board decided to commence - from May 2011 - a national newsletter that will encompass all stonefruit producers - total ownership. This newsletter will feature editorials from low chill and high chill Chairs; include my usual roundups and feature interesting articles from researchers and industry in general. Levy payers will need to register with Summerfruit Australia Limited via the website to receive this newsletter if you do not receive emails from me as part of the current member service. Simply visit the home page ([www.summerfruit.com.au](http://www.summerfruit.com.au)) <become a member >, register, then your details will be recorded and you will receive the next newsletters.

As a result of this decision, the affiliation with *Australian Fruitgrower* as a combined APAL production will cease from this issue. The SAL Board has privately conveyed its thanks to the editor and staff of Australian Fruitgrower for our association, and now publicly thanks all involved for their dedication. The new newsletter will be delivered to all regional organisations for electronic distribution to ensure maintenance of the network.

Please contact John Moore for any further assistance. m: 0419 305 901;  
e: [ceo@summerfruit.com.au](mailto:ceo@summerfruit.com.au) or mail:  
8/452 Swift St. Albury NSW 2640 ■

## New CEO for AFFCO

Australian Fresh Fruit Co (AFFCO) Chair Max Scales recently announced the appointment of Ms Poh Len Pek as Chief Executive Officer of AFFCO. She commenced on 2 May. Mr Scales said Poh Len has a most impressive background in strategic marketing, business development and international marketing, with prior experience with global agribusinesses including Bunge, Bonlac and George Weston Foods.

He said, "Taking advantage of AFFCO's first 15 years Poh Len will concentrate on engaging with all of our stakeholders and in the first months she will arrange to meet with as many of you as possible to draw her own conclusions on how best to serve you and work with you.

Her clear mandate is to ensure that all of our members, corporate supporters and suppliers recognise the value they get in engaging with AFFCO. This will be evident by her ability to build team calibre and pride and engender team work and cooperation across all businesses."

"Poh Len has proven capability to enhance strategic relationships with key internal and external stakeholders and her strong market insights and business experience will enable her to deliver these much needed value propositions. It is an interesting time for our industry. Nothing is certain and there are many competing opportunities and threats. The AFFCO Board feels that the appointment of Poh Len will give us renewed momentum and the best chance to take the business into the future." ■





Australian Pome Fruit  
Improvement Program Ltd

## APFIP activities update

### Evaluation

APFIP evaluation continues to be a major part of our business, with varieties being evaluated in six states at seven sites. We are currently evaluating 50 apple and 36 pear varieties. The number of varieties completed evaluation totals 41 apple 13 pears.

There are a number of varieties on the evaluation database now that have general access status. Full evaluation reports on these varieties can be viewed at [apfip.com.au](http://apfip.com.au). Access is available to the evaluation database via the visitor login under 'evaluation'.

Not all varieties that complete the seven years of evaluation gain general access status due to confidentiality agreements with some variety suppliers.

The main focus of the evaluation is to identify new varieties that perform well in Australia, however one of the key outcomes of this program has been to identify poor performing varieties before any commercialisation activities. This has protected growers from investment failure.

### Certification

Certification of plant material in the Australian apple and pear industry remains a high priority for APFIP.

APFIP has been working closely with its trade mark licensees to establish commercial production of certified dwarfing rootstocks. APFIP is the exclusive Australian licensee for the NAKB® M9T337 rootstock and its production has been licensed to APFIP certification trade mark licensees. Certification of varietal propagating material is critical to providing certified nursery trees to the Australian industry.

APFIP is working with its licensees to facilitate increased availability of certified commercial varieties. Commercial pressure from the nursery customers (growers) is now a key component of the certification process.

A certification database is currently being finalised, this database has been developed as a tool for the APFIP certification licensees to manage and control all of their certified material. The aim of the program is to have total traceability and virus indexing control of all certified material.

### Quarantine

APFIP has been actively identifying and importing into quarantine varieties from overseas breeding programs that may have potential in the Australian industry. There were seven apple varieties released from quarantine to APFIP in January 2011 to start the evaluation process, with a further four apple and two pears are to be released in late 2012.

A new PBR protected quince rootstock has also been imported from Europe.

The future of the Knoxfield (Vic.) and Eastern Creek (NSW) post-entry plant quarantine stations has yet to be decided. The leases at these sites expire in the next couple of years and a new station or stations need to be established. APFIP has been involved in workshops conducted by AQIS on the future requirements of the plant quarantine stations and understands that a proposal for new stations is now before the Federal Government.

An effective pathway through quarantine for the entry of new apple and pear varieties from overseas is vital for our industry.

### Repository

APFIP still maintains a material repository in southern Tasmania; all the original mother plants are housed there for continued evaluation and virus indexing.

APFIP is currently expanding this area as production allows, the main aim is to be able to supply our current and any new licensees with good numbers of certified stocks and budwood to help them get established.

### APFIP Project

The new project proposal for the period 2011-2016 is currently being developed. Continuation of the current business goals will be the focus as well as the inclusion of some new projects and activities.

### Tree Procurement Service

As previously reported in *Australian Fruitgrower*, APFIP has developed a Tree Procurement Service. This service is offered purely as a support package between the grower and nurseries, helping both parties understand each other's requirements in the production and delivery of their nursery trees.

We have developed a flyer (which should be delivered to growers with this issue of *Australian Fruitgrower*) that will provide an outline of what is on offer. We urge growers and nurseries to take advantage of this service. Anyone wishing to discuss this service can contact APFIP on 0408 503 528 or [mark@apfip.com.au](mailto:mark@apfip.com.au).

### CGA & APAL conference

APFIP will be attending the 2011 conference in Adelaide 31 July to 5 August, where we have registered to have an exhibitor's booth at the HortExpo. We will have a range of evaluation and certification material along with a variety display.

At this stage we are also hoping to have a couple of our variety suppliers there with us to showcase some of their material. We certainly look forward to catching up with industry and discussing any APFIP activities. ■

## Chinese delegation visits Australian horticulture

The APAL Chair and staff recently accompanied a delegation from China on an extensive visit to horticultural regions in Victoria and Tasmania.

The 21 member delegation was led by senior managers of the China Entry-Exit Inspection and Quarantine Association (CIQA) and included commercial importers-exporters.

Darral Ashton and Jon Durham travelled to Tasmania with the delegation to visit cherry and apple orchards and packhouses, while communications manager Stuart Gray accompanied the tour on visits to citrus, table grape and summerfruit operations in Mildura, Robinvale and Swan Hill, Victoria.

The delegation inspected operations as part of the ongoing dialogue between Australia and China to develop trade between the two countries in citrus, table grapes, summerfruits, apples and cherries.

The visit culminated in the third China-Australia Workshop on Horticultural Cooperation - Two Way Horticultural Trade between Australia & China, held on Tuesday 19 April. This is the first time the workshop has been held in Australia.

The Australian pome fruit industry has been developing relationships with CIQA and CIQA members over many years and greatly appreciated the opportunity to further develop relationships on this visit. The apple and pear industry hosted a lunch and dinner for delegation members in Hobart.

APAL managing director Jon Durham said, "Australia has a very small industry compared to the apple industry in China but we are proud of our industry and the fact that two of the

world's popular apples were bred and developed in Australia.

"The 'Granny Smith' apple was selected more than 100 years ago while Pink Lady was bred in Australia in the 1970s and released to industry in the late 1980s. Both are now in the top 10 apple varieties in the main apple growing countries of the world.

"Our industry believes that there are considerable opportunities for dialogue and cooperation between the apple industries of China and Australia and we appreciate and commend CIQA for its initiative in coming to Australia to further understand the Australian pome fruit industry.

"We are particularly keen to pursue our application for access for apples from fruit fly free areas of the Australian mainland," Jon said. ■

## Review of New Zealand IRA

APAL was briefed by Biosecurity Australia on the steps that are ahead in the review of the New Zealand apple imports Import Risk Assessment (IRA).

A draft report was made public in early May and a link distributed to growers via APAL eNews as soon as it was made public.

**The 60 day period for public review and comment will end early in July.**

APAL will be making a submission on the report, but any grower or industry person is welcome to do so as well. Submissions will be reviewed and the final IRA will be released on 17 August. ■

## Agricultural chemicals review

APAL has responded to a government proposal for a national scheme to assess, register and control of use of agricultural chemicals.

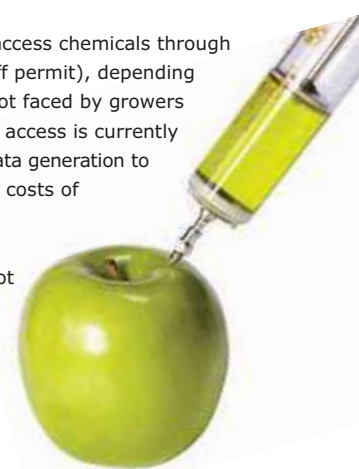
Prepared by the Product Safety and Integrity Committee of COAG's Primary Industries Ministerial Council, the scheme proposes a number of options to improve the effectiveness of the regulatory system and to harmonise the different State laws that govern use of off-label chemicals. APAL has criticised the Committee for providing insufficient time for consultation on such complex and important issues.

It would also appear that chemical users will not have an opportunity to comment upon the preferred reform options before they are put to COAG, despite the Committee failing to fully document how each of the options might operate in practice and how they might be implemented. APAL said that the Committee had also failed to provide the relative costs of each option, making it difficult for industry to rank alternatives.

APAL advised the Committee that apple and pear growers currently access chemicals through all three existing means (on label, off-label on permit and off-label off permit), depending upon jurisdiction. It is important, therefore, that undue hardship is not faced by growers as a result of any change brought about by harmonisation. That is, if access is currently available to growers, such access needs to continue. If that requires data generation to support that use being brought onto a label or onto a permit, then the costs of undertaking that exercise must be borne by government.

Furthermore, if the existing APVMA definition of permit uses would not allow that use to be incorporated onto a permit, then the definition must be widened to incorporate anomalies that might exist.

APAL recommended that the Committee assess how schemes such as the US IR-4 program and the Canadian Minor Use Pesticides Program could be adopted in Australia. ■







## Pink Lady apples in Shanghai supermarkets

Pink Lady™ apples are now available in Shanghai supermarkets in a trial program that started in mid-April.

Leader of the project, Coregeo Australia Manager Garry Langford, said the trial is the culmination of a three year effort which involved many visits to China.

"We learnt much from each visit and now have a good team of people and companies working for us to develop the Pink Lady market. We used a New Zealander who lives in China as a liaison person and had market research conducted by a local marketing company in April 2010. We are also working with a locally based legal firm to administer the Pink Lady trademark."

"Once the trial is completed, we will review the results with the aim to develop a full 12 month supply plan. The current apples were sourced from France."

"This should provide opportunities for Pink Lady growers in Tasmania and we are working with the Chinese officials to gain access for

mainland apples from fruit fly free areas," Garry said. APAL managing director Jon Durham also attended the launch. He said APAL had provided one of China's leading fruit

trading companies with a license to manage Pink Lady sales in China.

"It was great to see Pink Lady apples so well received by Chinese shoppers. It was also great to meet the people who have supported us to develop this program to the trial stage," Jon said. ■



### Nominations Sought for APAL Company Director - NSW

Apple & Pear Australia Limited (APAL) in co-operation with NSW Farmers Association is seeking nominations from Class A Members of APAL who are interested in being a Director on the Board of APAL representing the State of NSW.

In addition to serving as a Company Director of APAL the successful candidate would also be put forward to Horticulture Australia Ltd to be accepted as a member of its Apple and Pear Industry Advisory Committee.

Director Nomination Forms can be obtained from NSW Farmers Association by phoning [02] 8251 1700.

**Nominations must be submitted by no later than Friday 27 May 2011. Enquiries -**

NSW Farmers Association [02] 8251 1700  
Apple & Pear Australia Ltd [03] 9329 3511

Growing the Business of Farming **NSW Farmers Association**



### Nominations Sought for APAL Company Director - Victoria

Apple & Pear Australia Limited (APAL) in co-operation with Fruit Growers Victoria is seeking nominations from Class A Members of APAL who are interested in being a Director on the Board of APAL representing the State of Victoria.

In addition to serving as a Company Director of APAL the successful candidate would also be put forward to Horticulture Australia Ltd to be accepted as a member of its Apple and Pear Industry Advisory Committee.

Director Nomination Forms can be obtained from Fruit Growers Victoria by phoning [03] 5825 3700.

**Nominations must be submitted by no later than Friday 27 May 2011. Enquiries -**

Fruit Growers Victoria [03] 5825 3700  
Apple & Pear Australia Ltd [03] 9329 3511



# fruitgrower



## Western Australia

Western Australia continues to experience its driest, hottest summer on record with growers in both the Hills and South West growing regions being severely affected. This has had a considerable impact on yield, size and colour of fruit and has continually brought forward picking dates by two weeks on the previous year.

The 'Gala' season has ended and the 'Granny Smith' and 'Fuji' season are beginning. There have already been some Pink Lady® apples sighted on the WA market, however the maturity levels and quality of those apples has yet to be tested and then reported back to industry.

It is proposed that the maturity testing process continue throughout the apple season to capture Pink Lady and Sundowner™ apples, which industry hopes will show some improvement on the results gathered through the 'Gala' testing

### If the apple industry hopes to improve sales and reconnect with shoppers, then quality needs to be at the top of the agenda

exercise. Industry was disappointed with the results received after the 'Gala' testing concluded. After only 14 days of testing, 39 per cent of the sampled lines were considered unacceptable for sale, as they failed to meet the minimum Brix of 12. At the conclusion of the testing exercise, there was a total fail rate of 25 per cent.

If the apple industry is hoping to improve its sales and reconnect with their shoppers, then quality needs to be at the top of their agenda. With a quarter of the apples currently being offered for sale considered, by general industry standards, to be unsaleable, the desired turnaround for apple sales is currently unlikely to happen. The Western Australian stone fruit

industry is considering its options for a slightly more aggressive approach to promotion and exports this season, and will be launching these new campaigns to wider industry later this year.

Gavin Foord has started with Fruit West on a contractual basis as the Acting Executive Manager and is bringing his vast experience to the role. He will be working closely with re-appointed Market and Communications Manager Amy Green to establish a sound structure to move the industry forward. The permanent Executive Manager position for Fruit West will be advertised within the next month and any expressions of interest should be forwarded to Ingrid Smith, General Manager of the APC (e: [ingrid.smith@agric.wa.gov.au](mailto:ingrid.smith@agric.wa.gov.au)).

**Amy Green**  
Fruit West

## Victoria

Pear harvest is just about completed, although the quality packout have been good, the bumper crops of Williams, 'Beurre Bosc' and Packham's, combined with the reduction in cannery quotas, has resulted in a higher volumes sold on the domestic fresh market. This has not been a good outcome for growers with many now running out of storage for apples and having to hire more bins. Export has not been a viable option due to the high exchange rate of the Australian dollar which further compounds the volume of fruit going to the domestic market.

'Granny Smith' harvest is now complete with light to moderate crops being reported; most growers are now picking 'Fuji' and Pink Lady. Middle of the month rains caused a couple of days of picking to be missed, however the current climate conditions are ideal for finishing Pink Lady apples. Colour is good and starch plates are not too advanced so, as long as growers are diligent fruit should come off the tree in good condition. It has the makings of a vintage year for apples.

The Queensland fruit fly outbreaks are still causing problems for Victorian growers. Growers are being urged to maintain good orchard hygiene to ensure no over-winter populations. Fruit removal, spraying and baiting efforts are being made in both urban and

### Many growers are now running out of storage for apples (and) export has not been a viable option due to the high exchange rate of the Australian dollar.

agricultural areas to clean up these outbreak zones and kill this pest before winter sets in. FGVL with Alex Turnbull hosted a well attended field day in Turnbull's impressive new Pink Lady block at Ardmona. The demonstration showed that early yields on Open Tatura trellis was achievable within three years. Alex went on to explain that step one to getting his first year trees well over two metres high was good orchard soil preparation before planting, ensuring critical factors such as soil pH, phosphorus levels and organic matter were in place before planting and access to well-developed, young nursery trees to plant.

Chris Peters discussed training options and their impact on tree growth and development of fruiting structures in the young orchard. There was good grower discussion and interaction on this topic. This was followed by a relaxing BBQ catered for by Michael Crisera and Jenna McGlynn from Fruit Growers Victoria.

The 2011 'Fruit for Life' schools campaign has begun with the Gippsland group (and Aussie

Apples) delivering the program to 500 junior primary students at Strathaird Primary School in Narre Warren. This was quickly followed by the Mornington Peninsula group taking the Aussie Apple message to schools in Cranbourne and Moorooduc.

Gippsland Fruit Growers association will have its next grower meeting in Warragul on 10 May. Babis Lagos from E.C.G will outline an apple production training proposal for fruit growers and their employees.

FGVL's IPM training course for growers will continue on 19 May in Shepparton.

**Kath Boast**  
Fruit Growers Victoria







# state roundup

## Tasmania

► The Tasmanian weather produced a brief warm spell which was welcomed by apple growers to 'finish off' the crop and bring the sugar levels up. The crop appears to be up slightly in some areas equally and down in others, so overall it is probably fair to say that we may have an average crop. Fruit size is smaller this season and with good fruit quality and we have received reports of it being well received into the markets.

### A delegation from China will visit the Derwent and Coal River valleys.

The Tasmanian industry will be hosting a delegation from China which will attend the 3rd China-Australia Horticulture Forum held in Melbourne. They will only have a short time in Tasmania staying just one night, however there will be time to visit cherry orchards in the Derwent Valley and the Coal River Valley.

The Taiwan inspector will be in Tasmania through April visiting packing sheds and orchards as part of the annual inspections as required under the export protocols.

**Sally Tennant**  
Fruit Growers Tasmania

## South Australia

I expect everyone is getting a bit tired of discussing the weather, but the cooler and wetter than average conditions continue. This has had an effect of delaying the maturity and certainly lowering the sugar levels of late season fruit. The wet conditions are a pain for growers organising harvest labour and bruising on recently harvested fruit is more evident this year. Fruit size is up, however, but unfortunately, that fruit is in many cases on average too big to meet the narrow parameters set by our major supermarkets.

Apple sales and prices continue to be buoyant. This is just as well as tonnage is up on earlier and quite conservative estimations, but also because of larger fruit. Pear sales are flat and prices poor, with both a large crop and slow demand. Perhaps this is a hangover from a poor previous year? Some growers of pears are now scratching their heads wondering whether

### The Association recognises the need to manage the water resources of the state and the country, but is concerned that draft plans allow too much inequity.

they should remove trees that now appear uneconomic, but what to replace them with...?

The Association was heartened to see the State Minister for Agriculture and Fisheries, Michael O'Brien overturning a plan to limit the operating hours of the biosecurity roadblocks (Fruit Fly) at Yamba and Ceduna. Due to a high number of fruit fly outbreaks interstate, but also from industry pressure, the roadblocks will continue to deliver a 24 hour a day service. Water Allocation Plans continue to be a strong focus of interest for the Association. There are currently Eastern and Western Mt Lofty Ranges

and Lower Limestone Coast draft plans on the table and requiring of scrutiny. While the Association does recognise the need to manage the water resources of the state and the country, we are concerned that the draft plans allow too much inequity, whereby too few commercial users fund the entirety of the resource management. We feel that all users of the resource who benefit from that management should share the burden equally.

We are also keen to see that packing shed and coldstore water use is considered exempt from a grower's allocation as they would normally be considered industrial uses. The proposed water allocations for licensed users are to be based on hectares under irrigation only and have not considered water used for "industrial" purposes.

**Greg Cramond**  
APGA of SA

## New South Wales

Harvest in all NSW growing regions has been progressing well. Fruit quality is excellent and colour on red varieties had improved over the last week as the colder night temperatures have become the norm. The main varieties left to pick now are Pink Lady and Sundowner – let's hope the pickers survive the cold nights and don't head off for the Sunshine Coast.

Fruit prices have remained relatively strong with a large percentage of the 'Gala' crop being packed straight off the tree. Packouts have been very good and with some strong demand in the marketplace for No. 2s the processing sector is finding supplies for single strength apple juice are hard to find.

### Of major concern to both Orange and Batlow districts has been the return of the flying fox menace with colonies appearing to be larger than last year.

Of major concern to both Orange and Batlow districts has been the return of the flying fox menace. The colonies in districts appear to be larger than last year and while most people are very sympathetic about the destruction, it appears there is little that can be done to cull the numbers until they are removed from the endangered species list. The new NSW Primary Industries Minister - Katrina Hodgkinson - is definitely very supportive of growers but has

indicated that, until a case can be made to convince the Federal Government that they are not an endangered species, there is little that can be done.

I think maybe growers should get on this listing because before we might be the endangered species. Must go and bang a few cans together so the little dears return to their roost!

**David Gartrell**

## New pear – rich flavour, 'luxury' texture

Prevar Limited recently announced it has licensed the non-exclusive New Zealand marketing rights for a new pear cultivar with the development name PremP33, to ENZA Limited.

The pear was bred by fruit-science company Plant & Food Research [formerly HortResearch] which is known internationally for its apple and pear breeding program. Brian D'Ath, ENZA's Global Variety Development Manager, believes that this juicy pear will have very wide consumer appeal due to its "lovely silky and velvet-like smooth texture, juiciness and delicious flavour profile".

"It is the outstanding eating experience it offers, together with the comparatively longer shelf-life

of the ripe pear (exceeding 14 days), that will persuade consumers to keep coming back for more. We are excited about the niche market opportunities that are available and the positive consumer feedback we've received to date."

"Prevar has selected the trade mark name Velvetine™ for this pear which alludes strongly towards the pear's amazing texture. It has a natural russet over a green background and a classic European pear shape, which for some consumers may appear a little unattractive, but all the market evaluation evidence we have



confirms that the pear texture, flavour and ripe pear shelf-life are outstanding and highly-valued attributes. ENZA has an excellent reputation in bringing new varieties to market, so we are looking forward to their success with this new variety" says Prevar CEO Dr Brett Ennis.

**More information:** Dr Brett Ennis, Prevar Ltd, Hastings, New Zealand. t: +64 6 8352530, m: +64 21 388334, e: bme@prevar.co.nz ■

## Infostone: Push to collect 2011 industry data

Growers have started entering their 2011 data into the InfoStone system; the stonefruit industry's new online data collection system.

The InfoStone system allows data from growers to be collected and aggregated, providing the ability to develop an industry-wide picture of plantings, yield and related harvest time. "Having better information about industry plantings and production is critical to support good decision making both at a business level and an industry level. We are asking all stonefruit growers to enter their data over the next month, so we can start to generate industry-wide information for growers" commented Vanessa Wight, Summerfruit Industry Development Officer.

Data such as fruit type, number of trees planted, tree age and harvest time is collected in InfoStone. On an annual basis, growers are also asked to record an estimate of the volume of fruit they expect to produce and at the end of the season to provide updated information on actual yield. Collected data is then aggregated and only aggregated data is available - this ensures the confidentiality of individual growers' data.

"Experience from other horticulture industries tells us that industry-wide information is

invaluable in planning both management and marketing activities. It is intended that the industry reports generated will assist growers in determining what varieties to grow, so they can maximise their income. Industry reports can also be used to support more effective marketing campaigns for the domestic and export markets," Vanessa explained.

All Australian stonefruit growers should have already received an email and letter outlining how you can enter your data into InfoStone. For more information, or if you haven't received an email or letter please contact: Vanessa Wight, Summerfruit Industry Development Officer (Vic), m: 0447 511 344; e: ido@summerfruit.com.au

## Fresh Connections 2011 -

Tours to Queensland's best retailers and growing regions

Following a popular retail tour at last year's Fresh Event in Melbourne, the Fresh Connections 2011 conference and trade show is set to add two new tours to the mix. While this year's retail tour will take in new-look store formats by leading Brisbane retailers Coles and Woolworths, as well as some new fresh produce outlets, two additional tours (one fruit- and one vegetable-related) will also be on offer to delegates. Both new tours will begin with breakfast and an early morning tour of the Brisbane Markets at Rocklea which, as a key supplier to markets all around Australia, were significantly affected by the Queensland floods.

"With so many suppliers having their warehouse facilities at the markets, maintaining supply to retailers was critical so delegates will have the chance to hear some extraordinary stories of the steps companies took to find alternative warehousing and cool room facilities to ensure supply was maintained" said Michael Worthington, the event coordinator.

Following their visit to the Markets, the vegetable tour will head west of Brisbane to Barden Produce and Qualipack in the hard-hit Lockyer Valley, while the fruit tour will head north to Natures Fruit Company, Pinata Marketing and

Smerdon Enterprises - some of Australia's most innovative fruit growers. "Fruit crops always have quality issues with excessive rain so the purpose of going to the fruit growing areas north of Brisbane is to get a better understanding of what growers faced and what steps they took to turn their crop around" he added.

The fruit tour will include the packing and marketing of avocados, tour of the largest plantation of custard apples in Australia and visit strawberries and pineapples while being picked, harvested and packed together with tours of mango and macadamia plantations. ■





## US uni's get grants to 'Deliver more Flavourful produce'

Report from Barry McGlasson, Technical Editor - Summerfruit

According to US studies, Americans would eat more fruit and vegetables if they tasted better. The Universities of California Davis (UCD) and Florida (UF) recently received a grant from the USDA Specialty Crops Research Initiative to conduct two workshops on how to increase flavour quality of fresh produce. The conveners were Drs Beth Mitcham, UCD and Jeff Brecht (UF). The workshops ran over two days, the first at Davis, California in February and the second in Florida, this month. Attendees included representatives from the supply chain - from growers to retailers - breeders and researchers.

The workshops provided up-to-date information on recent results by breeders, researchers and industry on ways to improve the consumer acceptability of fresh produce. Ref. *UCDAVIS Postharvest Technology*. March 2011 *News from UC Davis*: <http://postharvest.ucdavis.edu>

### Comment:

For many years poor flavour and texture of fresh produce have been recognised by our US colleagues as major reasons for the failure of the American fresh produce industry to substantially increase per capita consumption. This has been despite active health promotion campaigns and the evidence that the incidence of obesity and overweight is very high and increasing. In fact, per capita consumption of many products including stone and pome fruit has declined or remained static. I am particularly pleased that the Summerfruit IAC has committed funds to a study of consumer preferences and objective measurements of quality (John Moore, *Australian Fruitgrower* April 2011).

We have relied on Californian information in the absence of local data. From my experience the taste preferences of Californians for stone

fruit are similar to ours but quantitative local data on preferences for texture, sweetness and acidity, and skin and flesh colour will be a valuable guide to the selection of new cultivars, marketing programs and research for our industry.

I have previously expressed my concern that some growers are expanding plantings of non-melting cultivars of peaches and nectarines without enough information on consumer preferences. It has been known for many years that some non-melting cultivars develop serious off-flavours when they become over-ripe or are stored too long.

There are cultivars developed by the Italians that may combine the best of both worlds; these 'stony hard' cultivars remain firm until treated with ethylene when they develop a melting texture and flavour. ■

## From the fruit to the bottle – refreshingly simple!



WASHER / ELEVATOR / MILL  
BELT PRESS COMBINATION

- Fruit Receival
- Fruit Washing / Elevating
- Fruit Milling / De-stoning
- Fruit Pressing
- Pasteurizing
- Filling (Bottle / Bag in Box)

Plant & Equipment to suit all production and budget sizes



BIN TIPPER



MILL



DE-STONER



HYDRO-PRESS



PASTEURIZER



AUTOMATIC FILLER

**VINIQUIP**  
INTERNATIONAL LTD.

Level 1, 5 Averill Avenue, Kohimarama, Auckland, New Zealand  
Auckland branch: Ph +64 (09) 578 3740 Fax +64 (09) 578 3741 E-mail [rickpenney@viniquip.co.nz](mailto:rickpenney@viniquip.co.nz)  
Hastings branch: Ph +64 (06) 879 7799 Fax +64 (06) 879 7736 E-mail [klos@viniquip.co.nz](mailto:klos@viniquip.co.nz)  
Australia FREEPHONE: 1-800 209 3740  
[www.viniquip.co.nz](http://www.viniquip.co.nz)

## Growing your market: Vigour management

By John Wilton, Deciduous Fruit Specialist, AgFirst

Apart from the market itself, managing tree vigour is the greatest juggling game on the orchard. It is incredibly difficult to get it right over the whole orchard every year. Orchard performance, fruit quality in particular, and production costs are all determined by tree vigour in one way or another.

The September 2009 Future Orchards 2012 walk notes by Ross Wilson and myself give a detailed synopsis of managing vigour in the orchard. In these notes we have attempted to define optimum tree vigour, which for young trees is to grow the tree rapidly over the first three to four years in the orchard to achieve full leader height by the end of the fourth leaf, leading to full canopy volume by six years out from planting.

In reality, from the data we have amassed on orchard performance, yields usually continue to increase in a curvilinear fashion through to at least 10 to 12 years after planting, even though it is theoretically possible to achieve full production six or seven years from planting.

Where vigour has been badly mis-managed early in the life of the orchard, it either falls well short of its production potential because the trees fail to achieve full canopy, or production hits a peak early in its life, then falls away because the canopy becomes too dense due to excess tree vigour. Incidentally, both these problems can occur in the same orchard block and possibly even in the same tree row if there is high soil depth variability.

Optimum tree vigour in the mature orchard can be defined as growing enough leaf to size the fruit and protect it from sunburn, yet allow adequate light penetration through the canopy for good colour development. This requires annual shoot extension growth in the region of 20 to 30 centimetres. Any more annual shoot growth extension than this can be considered excessive vigour and represents a loss in potential production due to photosynthates being diverted to shoot growth rather than fruit.

Provided fruiting wood can be maintained with adequate light exposure, the productive life of fruit buds in apple and pear trees is really quite long, so even with renewal pruning systems there is no need to replace fruiting wood all

that often. In well-maintained canopies, the productive spur life is possibly more than four or five years, so you only need to replace no more than 20 to 25% of the fruiting wood on an annual basis. You do not need a lot of new extension growth to achieve this objective.

This month I will cover some of the other vigour management tools with the emphasis on vigour reduction because last year's wet growing season will have thrown many orchards off balance into excess vigour.

### Controlling excess vigour

#### Vigour control options include:

- branch type\*
- pruning style\*
- crop load
- trunk girdling or scoring
- trunk incision
- root pruning
- growth regulators
- regulated deficit irrigation

\* refer last month's article (*Australian Fruitgrower*, April 2011 Vol5 No3).

### Crop load

Cropping is the best vigour control tool provided the correct balance between crop and growth is achieved. It falls down where there are big imbalances in the tree, or factors that limit sufficient fruit set.

Where big imbalances between cropping and vigour exist, other vigour control tools will be needed to bring the crop vigour balance into the range where regular cropping will maintain the balance.

#### Common factors that limit sufficient fruit set include:

- lack of adequate provision for cross pollination.
- biennial bearing leading to inadequate flower for a full crop in "off" crop years.
- excess vigour itself limiting flower density or causing heavy fruit drop.

- nutrient deficiency - particularly nitrogen.
- frost
- shade
- insect or pest damage to buds.
- poor drainage/waterlogged roots over fruit set period.

Many Australian orchards have been netted and this tends to intensify any pollination problems as there is less cross-row bee movement in netted orchards. Presence of steep fruit set gradients away from adjacent varieties, or away from pollinators is a sign that something needs to be done about beefing up the pollination.

Biennial bearing is difficult to break out of once it is established. The best management is to avoid it in the first place by building up crop loads as the orchard develops, rather than delaying cropping, then shocking the tree by suddenly allowing a big crop to set.

Losing a crop with frost in established orchards is a common trigger for biennial bearing.

### "Excessive vigour...represents a loss in potential production"

Where excess vigour limits fruit set or bud development, other vigour control measures are necessary before crop load can become a vigour control tool.

Where low nitrogen programmes are being implemented to improve fruit colour, make sure that the tree still has adequate nitrogen for fruit set.

Poor drainage and waterlogged roots in spring will inhibit fruit set on varieties sensitive to this problem. Trees with waterlogged roots will also over-react to certain chemical thinning programmes, particularly those involving ethylene release.

### Trunk girdling or scoring

If correctly implemented, this is a very useful vigour control tool.

The degree of vigour control is determined by timing and severity of treatment. Timing ranges from late bloom through to the December drop period. Around petal fall shoot growth is



# Future Orchards, Beyond 2012

- ▶ reduced by 70 to 80 per cent, falling off to 20 to 30 per cent shoot growth reduction at time of natural fruit drop.

Girdling prior to the natural fruit drop period improves fruit retention and may markedly increase hand thinning costs.

Technique also influences response. In New Zealand we have tended to standardise on the Double C technique, in which a bark strip 2 to 7mm wide is removed from each side of the trunk with 50mm overlap and 50mm separation where girdling is done manually. Narrowing the separation distance, or increasing the overlap will increase the vigour control response, while going in the other direction will reduce response. Girdling is a useful technique in blocks with tree vigour variation, because it can be varied according to tree vigour.

Some larger growers have mechanised the girdling using hydraulically operated cutting tools that roll around the trunk. These do not remove a bark strip, but just cut through the bark to the wood in an overlapping ring.

Over the years I have seen high failure rates with girdling due to poor understanding of the technique and poor supervision. To be effective, the flow of photosynthate in the phloem tissue on the inside of the bark needs to be interrupted, but not completely cut off because some

**Figure 3:**

*These mature, very vigorous 'Fuji' trees had two metres lopped off the top and then given trunk incisions with a chain saw in late bloom period. Not weak growth and good fruit colour development in this photo taken 2-3 weeks pre-harvest.*



**Figure 1:**

*This tree has been girdled a number of times, all but the one second up from the ground were ineffective because the cuts did not go deep enough.*



photosynthate needs to get through to the roots to maintain their health.

## Trunk incision

This technique involves making two chain saw cuts into the trunk, one from each side to a distance of one third to one half the diameter of the trunk at a distance of about 50cm apart.

It is a very aggressive treatment, but very suited to larger trees which are difficult to use the trunk girdling technique on. We do not know a lot about optimum timing, but have seen good results when it is done around the petal fall stage.

The effect seems to last for several seasons, so it probably does not need to be done all that frequently.

Be careful in windy climates because the trunk has been weakened. We have seen trees fall over following trunk incision treatment and this is seen as a risk if upper tree support is lacking, or the incisions are either too deep or too close together.

Even so, there have been some spectacular results from this treatment, particularly when used in conjunction with shortening tree height as well.

In a milder form, using only a hand pruning saw this technique might be a good vigour control tool for scion rooted trees on dwarfing rootstocks in intensive orchards.

## Root pruning

This technique is widely used in Europe for vigour control in intensive orchards.

**Figure 2:**

*Trunk incision cuts made with a chainsaw almost half way through the trunk, half a metre apart. Very effective vigour control as Figure 3 shows.*



Treatment usually begins as the orchard approaches full canopy and is implemented by pulling a cutting blade through the orchard 30 to 50 cm out from the trunk to a depth of 30 to 40cm to sever the surface feeder roots. Usually only one side of the tree is done at a time.

Typical timing is for the root pruning to be done during the dormant period or pre-bloom period.

Where tree vigour is particularly high, or it appears the first cut has given inadequate vigour control, or the crop has been lost through either frost or biennial bearing, a second root prune to the other side of the tree is done around late spring/early summer.

As root pruning reduces root volume, trees are less able to explore the soil for moisture, so in harsh, hot climates caution and a reliable irrigation water supply is essential to minimize water stress problems if exceptionally hot, dry weather occurs.

## Growth regulators

Regalis® and ethephon control shoot growth. Regalis is significantly more effective than ethephon and has the advantage of only giving growth control in the parts of the tree that come in contact with the spray. Ethephon has milder action at the low rates that are normally used, but can be a strong return bloom stimulant.

Regalis programmes for vigour control need to commence in the early stages of shoot growth before shoot length exceeds 5cm, and normally needs to be repeated several times at around three week intervals over the initial shoot growth flush period.

Continued over...▶



Continued...

## Growing your market: Vigour management

- Where vigour is very high, or shoot growth stalls through stress relatively early in the season, only to be followed ideal growing conditions that stimulates vigorous secondary shoot growth, these shoots can become very vigorous and are not usually responsive to further Regalis treatment once this secondary shoot growth is underway.

Where this problem is likely to occur, Regalis is useful for initial shoot growth control with later season vigour control managed by trunk girdling. Growth regulators are useful vigour control tools, but need careful and skillful management to avoid undesirable side effects.

They should not be viewed as a replacement for good tree husbandry practices such as pruning and other vigour management options, but as a tool to enhance the effectiveness of these practices.

### Regulated Deficit Irrigation (RDI)

Under normal Australian growing conditions, this is a vigour control technique ready-made for Australia. It depends on a low incidence of rainfall over the late spring/early summer shoot growth flush period to enable vegetative shoot growth to be shut down by placing the trees under mild water stress through limiting their access to available water in the soil.

**Figure 4:**

*These vigorous 5th leaf Jazz™ responded well to root pruning. The row on the left was not root pruned, whereas the one on the right was.*



In locations which receive good late spring and early summer rainfall, or in seasons when this happens, the technique fails because it is not possible to restrict available soil moisture down to the levels necessary for shoot growth control.

Likewise, deep soils with high moisture availability are also unsuited to RDI for growth control. Pears and most stonefruit respond well to RDI. It is less suited to apples, because it can induce fruit cracking problems once normal irrigation is restored in the run-up to harvest for fruit sizing.



**Figure 5:**

*The 'Fuji' tree in the foreground has been treated with Regalis®, while the one in the background has not. Note the vigorous shoot growth on the tree in the background compared to the settled growth on the treated tree in the foreground.*

Apples are also more sensitive to sunburn, with trees under water stress more likely to be affected than those with a ready soil moisture supply should unseasonably hot weather occur while the orchard is under a deficit irrigation regime.

### Summer pruning

Pruning out excess shoot growth during the growing season has a devigourating effect, because it removes leaf area before it has fully contributed to carbohydrate storage in the rest of the tree. Furthermore, once crop load is coming onto the tree, there will be much less new shoot growth response when structural cuts are made, such as leader topping to bring down tree height.

Summer pruning can be a useful tool for vigour management when used wisely, but a better long-term solution is to cut excessively strong branches prone to excess vigour out of the tree altogether in the normal pruning programme as was discussed last month. ■





## Designing a reliable test planting

By Dr Gordon Brown, Technical Editor – Apple and Pear

In the March 2007 edition of *Australian Fruitgrower*, I wrote an article on designing trials that growers could use to assess new orcharding methods. While this sounds boring it is interesting that, at the time, I had several requests for further information from growers and this is one of the articles that has been reprinted in a major grower magazine in the United States.

In the last two to three years I have been asked to assist in the interpretation of results from four grower field trials and unfortunately, due to poor layout of these only massive differences could be identified. Of interest is that two of these had HAL funding.

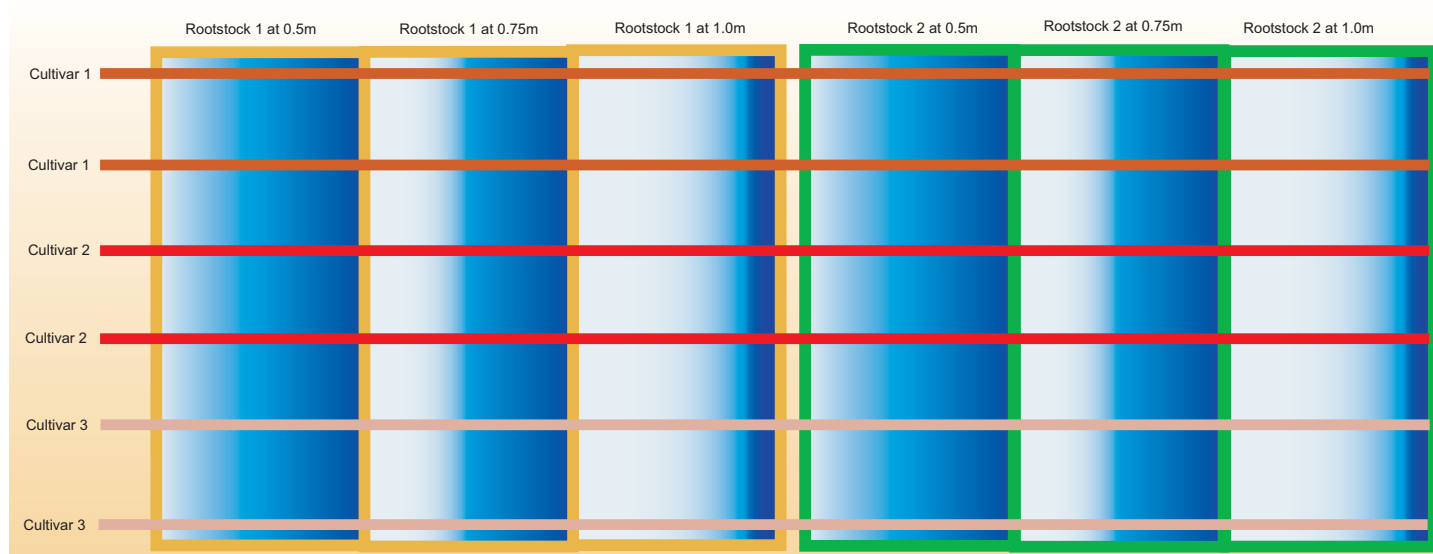
The fundamental mistake in all four of these grower trials has been a lack of replication and randomisation, a foundation condition for all methods of statistical data analysis which is required if it is desired to know with confidence that a certain treatment will result in a five or

10 per cent increase in yield, profit, packout or whatever is being looked at.

Bear in mind that, if we assume a 50 tonnes/ha crop with a \$2/kg value, then we are talking about a \$100,000/ha crop and if the wrong choice is made due to a poorly designed test planting, and there was a 10 per cent difference not identified, we are talking about \$10,000/ha loss in income per year! For a little bit of extra effort when establishing a test planting or applying a test treatment then, you can proceed with confidence that you have made the right choice and in the above example you will be \$10,000/ha/year richer.

Continued over...▶

**Figure 1. Faulty grower test planting to identify the best rootstock and planting distance for each of three potential new cultivars.**



**Protect your crop...economically.**

PRICE REDUCED  
DUE TO AUSSIE \$  
TAKING ORDERS NOW!

**Ideal for protection against hail, birds, bats & sunburn.**

Drape Net is easy to roll out, roll up and re-use...all for approx. \$6,500/ha.  
**Ideal for an existing orchard or new plantings!**

**Drape Net®**



For more information contact **Michael Cunial**  
on: **(02) 6365 3172** or **0415 663 413**  
email: [mcunial@bigpond.com](mailto:mcunial@bigpond.com)

somMAY11



Continued...

## Designing a reliable test planting

► So, to explain this in detail, I have decided to look at one of the HAL-funded trials that I looked at last year.

The test planting design is shown in *Figure 1*. In this test planting there were two adjacent rows, each of three different cultivars, represented by different coloured lines in *Figure 1*. These were on two different rootstocks represented by different coloured boxed outlines in *Figure 1* (green or brown). Each of the rootstocks were planted at three different distances apart, represented by the different levels of shading within the boxes (lots of blue = close planting). This test planting was based on each rootstock planting distance being a trellis bay so there were six rows each 90 metres long in the test planting. At the site there was a five metre fall from left to right and the drip irrigation lines were supplied with water from the left. Further, the soil was deeper on the downhill right side of the test site.

While the design in *Figure 1* looks pretty, and is easy to walk the rows and see differences, the design is flawed in many ways and potentially led to incorrect conclusions. Lets consider the site which had deeper soil on the right side and which was five metres lower than the left side. Ask the question as to where the irrigation system was most effective? The answer is always the downhill side, in this case the right hand side. This in combination with the deeper soil on the right means that the trees to the right

side of the site would be the more vigorous anyway. Hence, in this test, a rootstock and specific planting distance in a plot downhill will have been naturally more vigorous than any combination uphill due to its location and not due to the treatment.

This means that in this test planting, Rootstock 1 would have appeared more dwarfing than Rootstock 2 than is the case, and that the higher planting densities were more dwarfing than they are in reality. Therefore, if the test was to observe speed of early tree performance, there would be a bias in the decision made from this test towards Rootstock 2 at a lower planting density.

**If the test was to observe which rootstock and planting density was optimal for keeping trees small and producing well coloured fruit there would have been a bias in the decision making towards rootstock 1 at high planting densities.**

While the site layout above would have detected large effects such as cultivar/rootstock incompatibilities, its ability to fine tune detail is poor. Hence a decision could have

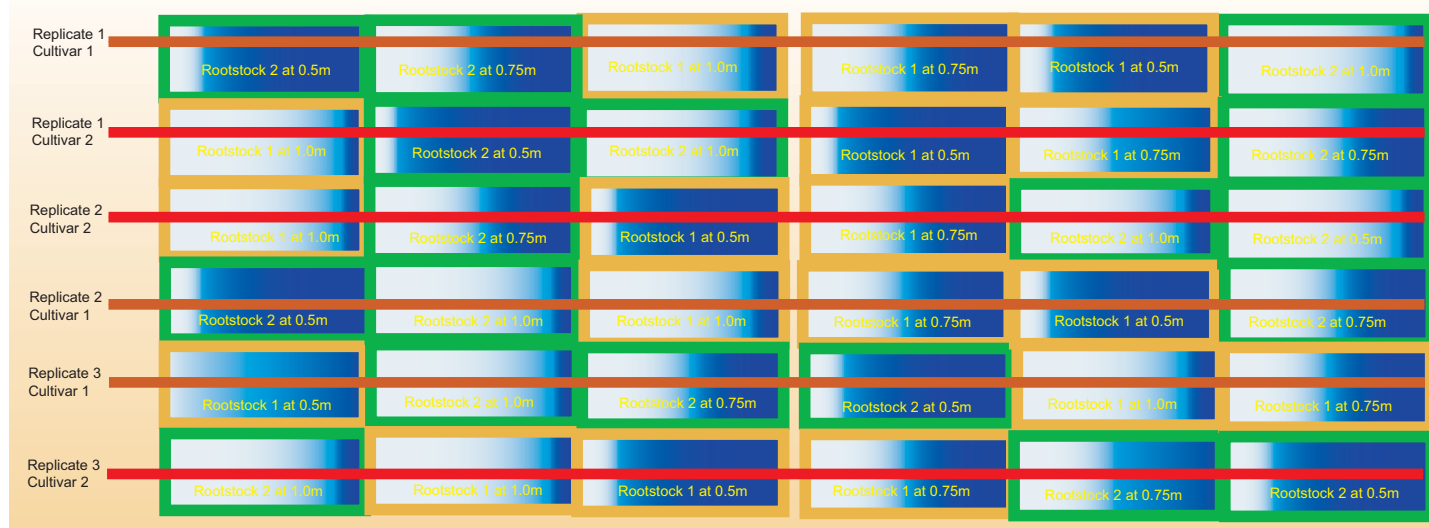
been made that did not result in that final 10 per cent increase in orchard productivity and hence could have cost the grower say \$10,000 per hectare. Another problem with this test orchard is that while the flaws in the layout are known there is also potential for unknown effects to have an impact.

For example, if Cultivar 1 was planted over an old orchard roadway, then the soil may have been compacted which would have adversely affected the performance of that cultivar and may have influenced the choice of rootstock and planting distance such that a combination that was not optimal for normal orchard soil may have been selected.

So, despite the good intent and the money spent on this test site, the data obtained is poor and may have led to an incorrect decision that may ultimately cost the grower hundreds of thousands of dollars over the life of the crop. This is a bad situation especially when with a little more care and minimal extra cost a accurate field assessment could have been planted.

The key to success in establishing a test site is 'randomisation' and 'replication'. With these two components imbedded in the site layout then the data collected can be statistically analysed and the probability that an observed result is real calculated. This is the basis of statistics and randomisation and replication are mandatory for any statistical analysis. ►

**Figure 2. A possible test site layout for a grower trial which can be used to provide accurate assessment of treatments. Note that this occupies the same area as the faulty layout in figure 1 and the cultivars are still in full rows making management of the site easy.**







► Lets now look at the site in *Figure 1*, and redesign the layout to one that gives more reliable information. The first consideration is the number of replicates to plant. As a rule of thumb never go below three replicates and if at all possible try for four or more. What is a replicate? It is a complete set of all treatments being studied. In the above example it is Cultivar(C) 1, Rootstock(R) 1, Density(D) 2:- C1R1D2, C1R1D3, C1R2D1, C1R2D2, C1R2D3, C2R1D1...C3R2D3 giving 18 different treatments. Each of these treatments needs to be in a plot large enough to give reliable results without any impact from the treatment beside it.

For the sake of this redesigning exercise let's stick to whole bays which allows for three whole rows to be a replicate. As there are only six rows available at this site, this only allows for two replicates which is insufficient - so rethinking the test is needed. A decision has to be made to delete one or more of the treatments such as cultivars, only use half bays for each plot (two treatments per bay) or to find an additional three rows. For this redesigning let's make a decision to drop one of the cultivars meaning that we now have two cultivars on each of six rootstock / planting density combinations giving 12 treatments per replicate (two rows) allowing for three replicates to be fitted into the site above.

Another rule of thumb is never to have less than 15 plots in total at the site. In the proposal above we have 12 treatments replicated three times giving 36 plots so this is fine. In other words if there are only two treatments to be studied, replicate and randomise at least eight times, giving 16 plots in total.

The next rule of trial design is to 'randomise' the position of the treatments within a replicate using a dice, pack of cards or other method. This is to cancel out any site characteristics such as deep soil at one end or a row over an old roadway, as examples. This randomisation needs to be performed for each replicate so each replicate will have a different layout.

This is best done on paper and it is a good idea at the end of randomisation to look over the proposed layout and ensure that no one treatment has not accidentally randomised itself into a cluster at one position of the site. Now let's consider the management of the site. As the day to day orchard management is simplest if there is a single row of one cultivar then, although this is not perfect, this is acceptable but randomly allocate the cultivar to each row within the replicate. It would be wise to discuss this with a person having knowledge of statistics to ensure that the information gathered can be analysed.

Applying these practices to the above trial a possible layout is shown in *Figure 2*. Here a coin was tossed to determine which cultivar was assigned to which row in each replicate. A set of cards from Ace to the 6 was separated from a pack of cards. The 6 rootstock and density combinations were then assigned a number from 1 to 6, the cards were shuffled and the order of the cards used to determine the sequence of treatments down each row. From the diagram in *Figure 2* it can be seen that the treatments are quite mixed up, meaning that and unevenness in the location at the test site has been 'averaged out'.

The data obtained from this site can be analysed by a statistical procedure to determine the means and the probability that any two means are actually different in real life. You will have seen this in some articles as

$p=0.05$  which means that there is a difference with a confidence of 95% and  $p=0.01$  means a confidence of 99%(100- $p \times 100$ ).

This procedure removes variation caused by site factors from the data allowing for accurate decision making to ensure that you get that extra \$10,000/ha that you are looking for which may mean an additional \$100,000 in the bank after ten cropping years.

Without this replication and randomisation the results obtained can be very inaccurate and can lead to incorrect decisions being made. Randomisation and replication are essential at all test sites. Just remember that every treatment needs to be at a site and in a different location at least three times (if there are five or more treatments) and all treatments need to be jumbled up with no organised order. ■

**STOREX**  
STORAGE TECHNOLOGY

## CA equipment specialists

- VSA nitrogen generators
- High efficiency CO<sub>2</sub> adsorbers
- Auto CA control systems
- Electronic O<sub>2</sub>/CO<sub>2</sub> analysers
- CA room accessories

### Contact a STOREX specialist

#### Bob Evans

P 02 6362 8830 M 0408 635 816  
F 02 6362 3363  
E [CAsalesandservice@westnet.com.au](mailto:CAsalesandservice@westnet.com.au)

#### Ray Spencer

P 03 5968 4583 M 0418 569 735  
F 03 5968 5743  
E [ray@controlinnovations.com.au](mailto:ray@controlinnovations.com.au)

## International summerfruit research abstracts

Compiled by Prof. Barry McGlasson, Technical Editor - Summerfruit

### Agronomy

#### **L-PEACH: A computer-based model to understand how peach trees grow**

This is the latest version of a computer-based model developed by T.M. DeJong and colleagues at the University of California, Davis, that simulates growth of peach trees. This interactive model integrates concepts related to carbon assimilation, distribution and use in peach trees. It also includes modelling of responses to tree pruning and fruit thinning. Three-dimensional depictions of simulated growing trees can be displayed on computer screens and the user can easily interact with the model. The authors have successfully used L-PEACH to relate rates of thinning to harvest fruit weight and confirmed fruit weight at harvest was higher in early thinned trees compared to later thinned trees. The authors provide details of the application of the model to encourage wider use both as an educational tool and for research.

**Lopez G et al. 2010 *HortTechnology* 20, 983-990.**

#### **Clinal variation of dormancy progression in apricot**

This co-operative project conducted in Spain and Republic of South Africa studied the influence of different latitudes and altitudes on the onset of dormancy and the breaking of dormancy in apricot cultivars ranging from low to high chill. Factors leading to dormancy appear to be both declining temperatures at the end of summer and decreasing photoperiod. Photoperiod: An earlier maximum depth of dormancy was found in those growing areas with higher minimum temperatures at the end of summer. The results obtained by these authors need to be further investigated using the same cultivars in the different locations used in this study. Ultimately this work may help low chill growers achieve more consistent flowering and fruit set.

**Campoy JA et al. (2011) *South African Journal of Botany*, doi:10.1016/j.sajb.2010.12.006.**

#### **Differential changes in proteins have been identified between post-dormant vegetative and floral peach buds**

Proteins were extracted from vegetative and flower buds of peaches during bud break and separated by 2D gel electrophoresis. Eleven proteins were differentially expressed by vegetative and flower buds. The function of some of these proteins is known. Other papers have been published

during the last year that has looked at gene expression during the post-dormant bud break. This growing body of knowledge will help towards a better understanding of dormancy release and bud break and lead to new ways to regulate these processes in commercial orchards.

**Prassinios C et al. 2011. *Journal of Proteomics* doi:10.1016/j.jprot.2011.01.018.**

#### **Support system for efficient dosage of orchard and vineyard spraying products**

This paper by European authors establishes a system to support the dose evaluation part of the pest registration process that will enable growers to make more efficient use of different spraying products across a range of orchards and vineyards. The purpose of the work is to facilitate regulatory harmonization across the European Union. Improved standards are needed by growers to enable more accurate calibration of spraying equipment and prediction of the optimum adjustment of label dose rate for different orchards and vineyards.

**Walklate PJ et al. 2011. *Computers and Electronics in Agriculture* 75, 355-362**

### Postharvest

#### **Effect of low oxygen storage conditions on volatile emissions and anaerobic metabolite concentrations in two plum fruit cultivars**

It is well known that the cool storage life of plums can be increased by modified atmosphere packaging (MAP) but the low oxygen and high carbon dioxide concentrations may interfere with the production of flavour volatiles when the fruit are returned to air at normal ripening temperatures. These Czech authors reported that long term storage in very low oxygen concentrations or higher carbon dioxide concentrations increased ethanol accumulation in the fruit. Low oxygen atmospheres slowed the production of esters and aldehydes but had little effect on the production of lactones and terpenes.

**Golias J et al. 2010 *Horticultural Science* 37, 145-154.**

#### **Hot water dipping to reduce brown rot in peaches and nectarines**

The authors showed that it is possible to control postharvest brown rot caused by *Monilinia laxa* by dipping peaches in water at 48°C for 12 minutes and by dipping nectarines at 48°C for 6 minutes without significant loss of quality. Dipping in hot water for 12 minutes decreased titratable acidity and increased the soluble solids concentration/titratable acidity ratio in nectarines. No symptoms of heat damage on the fruit were observed.

**Jemric T et al. 2011. *Food and Bioprocess Technology* 4, 149-154.**

#### **Non-destructive prediction of quality in nectarines**

This paper contributes information on the application of hand held near infra red (NIRS) spectrometers for predicting soluble solids concentrations (SSC), diameter, weight and firmness to assist quality management pre and postharvest. The reliability and accuracy of NIRS depends on the development of mathematical models based on hundreds of samples. The best results to date have been obtained for predicting SSC with relatively poor correlations for the other parameters.

**Sánchez M-T et al. 2011. *Postharvest Biology and Technology* doi:10.1016/j.postharvbio.2010.12.00.**







► **NIR-spectroscopy to determine the effects of regulated deficit irrigation on storage life of nectarines**

Essentially the same group of authors as in the previous paper (above) used a hand-held NIR spectrometer and also a laboratory instrument to measure changes in composition of fruit following cool storage that correlated with preharvest irrigation strategies. Doubts must be cast on the interpretation of the data presented because the fruit suffered high weight loss during storage that was accompanied by an increase in soluble solids concentrations. This latter increase is due to a concentrating effect of water loss since there are no insoluble carbohydrates in mature nectarines that can be hydrolysed into simple sugars after harvest.

**Pérez-Marín D et al. 2011. *Food Science and Technology* doi:10.1016/j.lwt.2011.01.008.**

**Multispectral indices for assessing fruit ripening**

This paper reports a study done with a small number of a red skinned cultivar 'Richlady' that shows that the disappearance of chlorophyll can be correlated with ripening (softening). The results appear to be similar to those reported by Italian workers (Ziosi et al. 2008) who developed a commercial hand held instrument for field estimation of harvest maturity. Unpublished work at the University of Western Sydney has shown that similar results can be obtained with the iQ Nirvana Vis-NIR unit (Integrated Spectronics) developed at the University of Central Queensland.

**Lleó L et al. 2011. *Journal of Food Engineering* doi:10.1016/j.jfoodeng.2011.01.028.**

**A study of changes in proteins during ripening of a non-melting and a melting peach cultivar**

This study used 2D polyacrylamide gel electrophoresis to separate proteins (proteomics) produced by 'Ora A' (non-melting) and 'Bolero' (melting) during ripening. Ora A has been used as a parent in breeding some of the non-melting cvv that have been released in Australia. It has been associated with off flavour development in fruit left on the tree long or when over stored. This research could lead to the identification of proteins that may be useful in the selection of new cultivars that remain firmer during ripening but are free of off flavours.

**Prinsi B et al. 2011. *Phytochemistry* doi:10.1016/j.phytochem.2011.01.012.**

**Food processing**

**Properties of apricot kernel and oils as fruit juice processing waste**

This study showed that apricot kernels are a potential source of valuable oil that might be used for edible and other industrial applications. Oil yields ranged from 42-57%. The main fatty acids were oleic, linoleic and palmitic acids.

**Ozcan MM 2010. *Food and Nutrition Sciences* 1, 31-37.**

**Health and human nutrition**

**Medicinal properties of Japanese apricots, *Prunus mume***

Fruit juice concentrate from Japanese apricots were shown to have multiple inhibitory effects on pandemic influenza A (H1N1) virus.

One compound, 'mumefural' was identified that inhibits growth of the pandemic virus in a dose-dependent manner.

**Sriwilaijaroen n et al. 2011 *Food Chemistry* 127, 1-9.**

**Postharvest**

**Chilling injury in stored 'Amber Jewel' plums**

Research at Curtin University, WA, showed that storage of 'Amber Jewel' plums at 5°C increases the rates of softening, respiration and ethylene production and the activities of the enzymes responsible for ethylene production compared to fruit stored at 0°C. These changes were associated with increased chilling injury (internal breakdown and browning) in fruit during ripening following storage.

**Khan AS et al. 2011 *International Journal of Food Science and Technology* 46, 642-650.**

**Genetics and plant breeding**

**Molecular tools for identifying peach cultivars**

As part of a cultivar improvement program Korean workers have developed DNA markers that can be used to distinguish different cultivars. These markers could be used to assert breeding cultivar patents and to prevent cultivar disputes.

**Sangeun H et al. 2010 *Korean Journal of Breeding Science* 42, 495-501. ■**

**ULTIMATE AGRI-PRODUCTS**

**Soil Crop Water SOLUTION SPECIALISTS**

**1800 003 244 admin@ultimateagri.com.au www.ultimateagri.com.au**

**GYP-FLO LIQUID GYPSUM** **PH-PLUS LIQUID LIME**

## Value adding: How to make fruit wines and cider

By Dr Gordon Brown, Technical Editor – Apple and Pear

Most of you will know me as a scientist working in the pome and stone fruit industries. What most of you will not know is that, together with my wife, I am also a commercial producer of about 1200 litres of cherry and apricot fruit wines which we market through our Dry Ideas business. In addition I am the president of the Tasmanian Fruit Winemakers Association which has run the Australian Fruit Wine Show for the past 10 years. Hence for this edition of Australian Fruitgrower we decided that an article on how to make fruit wine and cider may be timely for those interested in trying this possible use of low value fruit.

This article is about how to extract juice, ferment it and make it into a drinkable wine or cider. It is not about the production of fruit liqueurs where near pure alcohol is purchased and added to fruit juice. There is a big market for liqueurs so you should consider these in your business strategy, especially as they are easy and reliable to make and the public and wine outlets know what they are.

Fermented wines on the other hand are trickier to make, although if you get it right they can challenge many wines produced from grapes. These wines are not as sweet as liqueurs, they can be quite dry and have a complex flavour only reminiscent of the fruit they were made from. After all does a grape wine taste strongly of fresh grapes?

Of course if you are considering selling fruit wines you will need the appropriate state licence, local government approval for your premises and you will need to register for WET (wine equalisation tax) tax. In practice you will probably never have to pay WET tax as the first \$500,000 of WET tax can be claimed back in the same BAS statement where you pay it. If you plan on distilling your wines you will also need a distiller's licence from the ATO along with a still and a bond store. One of the main differences between fruit wines and grape wines is a difference in the FSANZ (Food Standards Australia and New Zealand - [www.foodstandards.gov.au](http://www.foodstandards.gov.au)) in that with fruit wines - unlike grape wines - it is

allowable to add water and sugar. This increases the tools available to the fruit wine maker, although these two ingredients should be used with caution. Too much water will reduce the flavour and colour of the wine and too much sugar will make the wine too sweet and the discerning pallet will identify added sugar. At the Australian Fruit Wine Show the judges will mark a wine down if they can taste sucrose.

The title states that the article is about fruit wines and cider. In reality cider is apple fruit wine and the same methods are used.

### Fruit selection

The first challenge in making wine is to select the fruit to make the wine from. Bear in mind that the wine will be a reflection of the initial fruit used. Hence tasteless fruit will produce tasteless wine and also fruit with rots will carry a rotten fruit flavour across to the wine.

The higher the fruit sugar content the higher the alcohol content of the wine if no sugar is added. As a rule of thumb if a fruit is at 16% TSS then, when fermented to a dry wine, it will have about 8% alcohol.

Think about the flavour of the fruit being used and what will be left when the sugar is gone. A 'Golden Delicious' apple is lovely fresh but it is a high sugar, low acid and low phenolic apple such that the cider produced, while being high in alcohol, will be a low acid and low phenolic drink and hence have poor flavour. This is why

in more established industries, such as grape wines and cider production overseas, there are specific cultivars of fruit grown specifically for wines. Choose a fruit that has good acidity, good levels of tannins (bitter compounds) and adequate other flavours that can be transferred to the wine.

**"These wines have a complex flavour reminiscent of the fruit they were made from"**

Also consider blending different fruit at this stage to achieve the desired result. For example, apricot wines tend to be strong across the sides and back of the tongue while sweet cherry wine tends to be dominant down the centre so when the two are mixed a more complete flavour sensation is achieved. Equally, adding a few strong apple cultivars to desert apples can make the difference in making a satisfying cider.

### Production of juice

Having chosen the fruit to make the wine from the next challenge is to obtain a fruit juice, with minimal oxidation. If working on a small scale then a domestic fruit juicer may be used but be aware it will take about one hour to produce about 10 litres of juice so commercially larger systems are required.

In cider manufacture it is common to mill the fruit into small pieces using a wide range of equipment and to then squeeze the juice in a press. Again there are a range of press styles and sizes that may be used and as this is essentially the same process as grape wine production there are many units of a whole range of sizes that are freely available in Australia. This same equipment and process could be used for pears or other large crisp fruit. For small soft fruit such as cherries the press may be all that is required.



**Figure 1:** Different additives at juicing and their effects on fermented apple wine. (L to R) ascorbic acid, heated, citric acid, untreated and sucrose.





► At Dry Ideas we use a modified brush sieve for obtaining our juice. This is a horizontal perforated stainless steel cylinder with brushes rotating inside. The fruit is pushed through the perforations by the brushes and the skins, stalks and stones are effectively filtered and emerge from the end of the cylinder. This equipment can juice half a tonne of fruit (an apple bin) in about one hour.

On our machine we have replaced the brushes with thick Teflon 'beaters' which is more aggressive and reliable. This equipment is suitable for cherries, apples and juicy plums, peaches and nectarines although it is not suitable for apricots or mealy stonefruit which produce a puree with this equipment. While this puree can be fermented, the yield of clear wine at the end is disappointingly low. For these fruit we immerse the fruit in a 35% sugar solution (1kg of fruit/litre of syrup), heat it to 68°C and leave it a couple of days and then remove the fruit. You will be left with about 30% extra liquid at about 25% TSS. This liquid can be reused, after addition of more sugar, on a second batch of fruit to increase the colour and flavour of the juice.

With apricots this process can extract a lot of skin flavours so we have found it wise to remove the stones first. The hole created provides access to the fruit flesh for the extraction of juice and the removal of the stones also removes the source of a nutty flavour that can affect stonefruit wines when the stones are left in the ferment. Another producer of apricot wine that I know adds the whole fruit to the syrup and then adds the yeast to start the fermentation and relies on the yeast breaking down the fruit to extract the flavour.

Having extracted the juice it is necessary to ensure that oxidation is minimised and the juice is placed in a container for fermentation. Oxidation is minimised by minimising contact of the juice with air, the addition of antioxidants, or heating to destroy oxidase enzymes.

At Dry Ideas we heat our juice to eliminate the wild yeast that will be present on the fruit and to destroy polyphenol oxidase, responsible for fruit and juice browning. To heat the juice we simply pump the juice out of the tank and

through a coil of copper pipe in a fish and chip deep fryer and back into the tank. The thermostat on the deep fryer needs to be set about 10°C above the desired juice temperature and a second thermostat controls the pump. This avoids direct juice contact with heating elements which can cause caramelisation of the fruit sugars but be aware that without agitation cold juice will remain in the bottom of the tank, below the pump pickup, and this will remain 'non sterile' if this is the objective of this exercise.

Also be aware that this heating can destroy ascorbic acid (vitamin C) if it has been added.

This is an appropriate time to taste the juice and add acid or tannins if it is felt they are necessary. Different acids have different flavours so you will need to choose these carefully. Common fruit acids are citric, malic and tartaric and there is a whole range of different tannins. These will be available from your wine equipment supplier. *Figure 1* shows the impact of some additives at this stage on apple wine after the primary fermentation.

### Fermentation

The fermentation container can be any container used by the grape wine industry, such as stainless steel tanks, plastic drums, bins and (notably for growers) it can include large laminated bags that fit inside a standard apple bin at about \$100 for a 600 litre bag. Bear in mind that at the end of primary fermentation (four to eight weeks) there will be a lot of solids in the bottom that will need to be cleaned out.



**Figure 2:** A 600 litre fermentation tank full of cherry wine.

Personally we use 600 litre plastic water drums with a large lid fitted although, for small experimental runs, we use small 30 litre drums available 'off the shelf' (*Figures 2 and 3*).

If ordering these, as opposed to buying one 'off the shelf', then advise the manufacturer that it will be used for wine and a different plastic, more resistant to alcohol, will be used. The next decision is what yeast to use. Here there is a huge choice and all will affect the flavour of the end product. The first decision is whether to use the naturally occurring wild yeast from the fruit or a purchased yeast.

In Tasmania a major grape winemaker allows the natural yeast to develop for 'Pinot Noir' grapes but uses purchased yeast for his more delicate white wines. Each orchard and winery will have a different range of natural yeasts such that using natural yeast results in a specific orchard or winery flavoured wine.

Dry Ideas has produced some award-winning wines using natural yeasts, however, it has also produced some disasters. For the beginner it is wise to use purchased yeast and there are many of these available for wine, beer and bread making. In making a choice, consult with others and your local wine equipment or home brew supplier who will stock a range of yeasts. Think about a wine or beer that you like and consider if the flavour will match the desired wine.

Personally I like 'killer' yeasts which out-compete other yeasts, preventing wild yeast from becoming active and affecting the results. Having added the yeast the next step is to place the fermentation in a position for primary fermentation. If the wine is in a warm location then the fermentation can be extremely rapid producing volumes of carbon dioxide that fizz out of solution. This has four effects worth mentioning:

- Firstly the fizz can create a lot of foam which can potentially ooze out the top of the container so position the container in a location where this will not matter.
- Secondly, the rapid activity creates a lot of heat which can make the fermentation even more rapid but may also cause it to die away if it gets too hot.
- Thirdly bubbles produced in the rapid fermentation will carry away many of the volatiles, potentially reducing the flavour of the wine, and

*Continued over...*

Continued...

## Value adding: How to make fruit wines and cider

- ▶ finally, the rapid fermentation will result in a very short period of primary fermentation.

For these reasons I prefer a cool fermentation so consider doing this in a cold location such as a spare cold room (set at say 15°C). The main downside of cool fermentation, especially if not using a temperature controlled environment, is that fermentation can look complete but restart again in the following spring when the temperatures start to rise again. It is wise to be aware that this can happen.

### 'Racking' the wine

When primary fermentation has finished, usually after six to eight weeks, and the wine has had time for the solids to settle to the bottom it is time to 'rack' the wine. This is where the wine from the top of the tank is removed from the solids in the bottom of the tank. For this purpose I find a positive displacement pump is great (Mono™-type, piston or diaphragm) as these pumps do not need priming.

Be careful to use sterilised equipment and put the wine into a sterilised tank that can be sealed from air. For fruit wines, sugar can be added at this stage to increase the sweetness of the wine to a desired level but be aware that this will almost certainly result in more fermentation. Fermentation will continue till about 15 to 20% alcohol (depending on the yeast used) at which time the alcohol level will prevent any further yeast activity. Traditionally sulphur is used for sterilising equipment, however, some people suffer from sulphur allergies so other methods can be used. Sulphur has the added advantage in that it prevents oxidation of the wine although there is a maximum permissible level allowed in wine.

**Figure 3:** A 30 litre fermentation tank with apple wine. Note solids visible in the bottom.



When placing the wine into a new tank try to avoid mixing with air as much as possible to reduce oxidation and try to fill the tank completely. When fermentation is complete then either fill the tank with more wine or consider adding carbon dioxide to the top to limit oxidation. For small scale operations this can be obtained from a CO<sub>2</sub> capsule used in soda siphons. These capsules also fit whipped cream vessels as used in commercial kitchens and these are more readily available. Make the tank airtight but with a relief valve such as a water bubbler so if any fermentation occurs the gas produced can escape. The wine is matured in this tank.

### Maturation

During the maturation process the wine acidity drops and the wine changes its flavour and usually becomes more mellow. This process can in fact continue for several years.

Keep the tank sealed to stop vinegar flies from entering. These flies can introduce a bacteria that lives on the alcohol and convert it to acetic acid. Keep sampling. One of the things to be looking for is any cloudiness. During maturation the wine should become crystal clear and if it is not then there are a range of clarifying agents such as bentonite, egg white, egg shell, isinglass, casein or silica that may be added to aid in clarification. As cloudiness can be due to different causes such as proteins, pectins or nutrients, you may need to experiment with these clarifying agents to determine which one is effective for each batch of wine.

### Bottling

After about nine months the wine can be bottled. For still wines this can be into almost any bottle. For sparkling wines and ciders then some more sugar is added prior to bottling and this restarts fermentation, so a bottle and cap system capable of withstanding the pressure is required. For fortified wines, such as ports, extra alcohol is added prior to bottling.

### Marketing

Finally a word about marketing. Australians are experienced with beers and grape wines and they are aware of ciders and ports. Unfortunately Australians have had little exposure to fruit wines and many think of sweet liqueurs as being representative of fruit wines or alternatively they have tasted somebody's home made wine which has been terrible.

Few are aware that fermented fruit wines can be used as table wines in much the same way as grape wines complementing specific dishes. This makes marketing of ciders, ports and liqueurs relatively easy in comparison to fermented fruit wines where people will need to try before they buy.

Hence, to grow the fruit wine market there is a need for a major education and marketing program but don't be put off, it can happen. In Tasmania there is a cellar that planned on selling grape wines and some fruit wines but in reality they are now selling fruit wines and some grape wines. Personally I think that the general consumer has become a little bored of grape wines. After all, over the last 40 years we have moved from beer to cheap cardboard box wine to bottled wine to quality bottled wine so maybe the population is ready to try fruit wines. This may explain the recent interest in ciders. ■





## Production costs and profitability of organic apple production in Poland

Report from Dr Gordon Brown, Technical Editor – Apple and Pear



At the International Horticulture Congress held in Portugal last year, a poster was presented by Brzozowski and Zmarlicki with the title of Production costs and profitability of organic apple and strawberry production in Poland. This reported on costs and profitability of conventional versus organic orchards over three seasons and on 16 apple orchards. A table of costs and profit was presented and is replicated here in Table 1.

**Table 1. the costs and profitability of conventional versus organic apple production in Poland. Data converted from Polish PLN to AUD using 1PLN = \$0.344**

ITEM	CONVENTIONAL APPLES	ORGANIC APPLES
Yield t/Ha	23.5	12.7
Average price AUD \$/ kg	0.37	0.43
Gross Income AUD \$	8,892	5,461
Cultivation costs	3,368	2,833
Recapture of establishment costs	1,279	870
Grading costs	808	524
Storage costs	1859	1092
Overheads	505	425
All Costs	7,822	5,745
Net Income	1,071	-284
Government support	0	575
<b>Final economic result \$/Ha</b>	<b>1,071</b>	<b>291</b>

### This paper concluded that:

- More marketing activities are needed to bring up the price for organically cultivated apples and thus to increase their profitability.
- The main reasons for growing organic apples in Poland were the government subsidies
- A stronger support from science and extension agencies is necessary to increase the quantity and quality of yields in organic production apples in Poland. ■







**The complete range of battery operated tools for the professional pruner**






F3010 Standard      Kit Medium      Kit Maxi



**For a clean and precise cut.**



**New Powercoup Electronic Saw**



For a demonstration contact:  
RYSET (Aust) Pty Ltd  
Ph:(03) 9457 2982 or email:info@ryset.com

[www.ryset.com](http://www.ryset.com)

## International apple and pear research update

Compiled by Dr Gordon Brown, Technical Editor – Apple and Pear

### May International Research Update – Dr Gordon Brown

#### Nursery and new cultivars

##### Switzerland

A new apple cultivar - Galiwa - which is a cross between Gala and a black spot-resistant cultivar has been released. The fruit are superior to Gala and the tree is resistant to black spot.

##### China

A project has been concluded where the gene for polyphenol oxidase, which causes flesh browning in apple and pear fruit, was modified to reduce its expression and then re-inserted back into Yali pear and this now provides a foundation for breeding new anti-browning pear cultivars.

##### Republic of Korea

Using genetic engineering procedures a gene for calcium uptake and transport was inserted into Hongro apples. The modified lines of trees produced had increased levels of calcium in the leaves and fruit.

##### Spain

Bacteria located on shoots of adult plants can present problems affecting tissue culture success. Traditional sodium hypochlorite treatments are often harmful to the plant and are not effective against these bacteria. It has been found that the addition of sterile cefotaxime to autoclaved culture medium at 150 mg/L improved both shoot length and leaf expansion while inhibiting bacterial growth in tissue culture.

##### Germany

The apple varieties used in the modern commercial apple cultivation are nearly all genetically based on six relatively disease susceptible "ancestor varieties": Golden Delicious, Cox Orange, Jonathan, McIntosh, Red Delicious and James Grieve. This applies to varieties bred after 1920 until today, including the new scab resistant varieties and has led to a genetical narrowing of commercial cultivars. A study of an unsprayed heritage orchard has identified that there is considerable resistance to diseases not found in the modern commercial cultivars.

##### China

Stone cell appears in most pear cultivars with negative effects on pear internal quality and

consumer acceptance. Lignin is the important component of stone cells and a gene associated with lignin synthesis, PpCCR has been identified and this gene is more active in fruit cultivars that develop stone cells.

#### Production

##### Pakistan

In a survey for zinc levels of apple orchards from all apple growing districts no relationship between soil and foliar zinc levels was identified and foliar zinc was positively related to soil organic matter as well as clay and silt contents and negatively related to soil pH and sand content.

##### China

In a study of the effect of renewal or long branch pruning of apple trees on tree photosynthetic rate and fruit quality it was found that renewal pruning significantly increased the rate of photosynthesis and this caused an increase in fruit yields, fruit weight, fruit shape index as well as increased acid and sugar content of the fruit with no change in fruit firmness.

##### China

A trial using different rates of nitrogen application to Fuji apple trees identified that leaves collected in August, before harvest, provided the best time for diagnosing correct nitrogen nutrition.

##### China

Investigations into the respiration rate of pear buds during winter found that in early dormancy the rate of respiration increases until the temperatures drops dramatically causing the respiration rate of the buds to also reduce dramatically. Respiration rate of the buds rose rapidly at the end of dormancy which could be stimulated by GA<sub>3</sub>.

##### Mexico

Partial rootzone drying was compared with full commercial irrigation practices on Golden Delicious apples to assess the impact of this water saving technique on fruit. This study found that partial rootzone drying did not damage fruit quality at harvest or after storage at room temperature. Additionally, the technique saved about 3240 m<sup>3</sup> of water per hectare.

##### Italy

In a trial where Gala apple trees were shaded with 90% shade cloth for a week at 30 days

after full bloom it was found that the fruit growth rate and phloem flow to the fruit decreased gradually over time and that the xylem flow was not affected. These results suggest that the decrease in fruit growth rate under shading should be attributed to the reduction of canopy photosynthesis, rather than to a direct effect of shading on fruit sink strength.

##### Chile

Gala apple trees were thinned to 4, 6 or 8 fruit per cm<sup>2</sup> for three seasons and the effects on yield and fruit quality studied. Cumulative yield from the treatments was 123, 157 and 188 tonnes/ha respectively. Interestingly there was no difference in the total yields of fruit with individual weights over 194g and the increased crop load improved yield of fruit greater than 172g.

##### Republic of Korea

Lateral fruits of self-thinning apple cultivars fall naturally within 30 days after full bloom and only central or King fruit remains to mature. In a study of the different active enzymes in the pedicels of young fruit it was found that lateral fruit had higher proteins associated with senescence, temperature stress, protein degradation, fruit browning and sorbitol metabolism. These findings indicate that different genes are active in lateral flowers in self-thinning apple trees.

##### China

In a survey of apple orchard soils from the Shaanxi region for heavy metal contamination it was found that mercury was the most dangerous heavy metal followed by cadmium. Using an ecological risk model it was concluded that 27.42% of the orchard soils were slightly hazardous, 56.45% were moderately hazardous, and 16.13% were heavily hazardous.

##### Germany

Five reflective materials were used under Gala apple trees under hail netting to improve fruit colouration. Extenday and Svensson ILS AluTM, a composite material with interwoven aluminium strips, produced 78-80% well-coloured, class I fruit while Mylar®, Daybright® and Uniset O® produced 70-74% class I compared with only 57% in the grassed controls. All reflective cloths increased fruit sugar levels and most advanced maturity by up to four



## Harvest and Postarvest

### China

It has been found that there are problems when using wires to collect information and for the control of a robotic fruit harvester and a system using wireless communication within the robot has been developed which is extremely reliable.

### USA

In the testing of a new computerised fruit firmness machine it was found that the machine could predict fruit crispness as perceived by a taste panel which the standard fruit penetrometer could not detect.

### Republic of Korea

Fuji fruit that experienced -3.5°C temperatures for 7 hours were harvested at 2 and 6 days after the frosty conditions and these fruit were compared to a harvest that occurred 1 day prior to the frost. Frosted fruit had higher levels of ethylene production, were softer and had lower fruit sugars. Fruit harvested 6 days after the frost were of a higher quality to those harvested 2 days after the frost although the difference was not as great after fruit storage for 8 weeks.

### Japan

A micro magnetic resonance imaging (MRI) unit was examined for its use in following the growth, development and movement of insect larvae in fruit and the equipment was found to be a useful tool.

### United Kingdom

The effect of atmosphere and temperature on the development of storage fruit rots by *Botrytis cinerea* and *Neonectria galligena* (European canker) was studied and it was found that changing the atmosphere had little influence on rot development and while lowering temperature reduced rot development this is limited by the appearance of low temperature breakdown in the fruit.

### Brazil

A study of patulin toxin production caused by *Penicillium* rots in apples destined for juice it was found that fruit could be cold stored for no more than 25 days at 4°C and patulin production increased significantly when fruit were stored for 3 days at 25°C. These results confirm that time in which apples are taken out from cold storage before juice production is critical in order to prevent patulin accumulation.

### China

A study of the reflectance pattern of infra red light from LEDs on a pear grading line has found that online detection of soluble solids content and fruit size using a LED light source-detector is feasible.

### Iran

A method of using image analysis to accurately predict the moisture content of stored Golden Delicious apples has been developed.

### Italy

The Campania region has a "Protected Geographical Indication" trademark and a study using the amino acid profiles of apple fruit has been developed to identify apples that have been grown within the region.

### Republic of Korea

In a study of the ripening behaviour of three apple cultivars, Tsugaru, Hongro and Fuji it was found that Fuji produced ethylene at a steady rate over the study period while the other two cultivars displayed a typical climacteric rise in ethylene.

### China

Untreated pears were compared with pears coated with either carboxymethyl chitosan or Semperfresh® prior to storage and while both coatings improved storage characteristics the carboxymethyl chitosan coating was better in fresh-keeping effects than the Semperfresh coating.

### Switzerland

Two new disease resistant cultivars of apple were consumer tested in French and German speaking regions of Switzerland. This showed that the new cultivars were acceptable and had similar flavour preferences in both regions. The flavour of the fruit was found to be the attribute that affects the overall sensory judgement. The importance of the ripeness of an apple was highlighted with flavourless and floury apples being rejected by the customers. ■

## Human Health

### Germany

Using human colon carcinoma cell lines and apple polyphenols it has been identified that "consumption of apples and apple-derived foods may have positive effects on the intestinal barrier in healthy humans and may play an important role in the prevention of inflammatory bowel diseases".

### China

A new method of extracting polyphenols from apple pomace has been developed and it has been found that apple polyphenols consist of chlorogenic acid, caffeic acid, syringin, procyanidin B2, (-)-epicatechin, cinnamic acid, coumaric acid, phlorizin and quercetin, of which procyanidin had the highest content of 219.4 mg/kg.

### USA

A study of bacteria present on fruit and leaves of conventional versus organic apple production found differences between the two production systems and no bacteria associated with illness in humans were detected. The differences between the two production systems indicate that crop management practices influence the bacteria on the surface of apple leaves and fruit.

## Pests and diseases

### Brazil

The effect of several insecticides on lacewings (*Chrysoperla externa*) was studied and it was found that carbaryl, fenitrothion, and methidathion caused 100% adult mortality and abamectin and sulphur caused mortality rates up to 10%. Trichlorfon was harmless to adults and no compound reduced oviposition capacity although sulphur reduced egg viability which may be associated with observed malformations of the female genitals.

### Turkey

The efficacy of trunk treatment with cotton seed oil, lime and used motor oil, were evaluated for the control of apple clearwing insects. It was found that while no effects were noticed in the year of treatment in the following season the treatments reduced the number of pests. The overall results suggest that used motor oil and cotton seed oil may have potential for the control of apple clearwings.

### Iran

The hawthorn red midget moth, *Phyllonorycter corylifoliella*, is one of the most serious pests of apple and pear orchards in Iran and it has been found that at 35°C, *P. corylifoliella* failed to develop beyond the first instar and had an optimal development temperature of 25°C.

### Argentina

Studies of traps for codling moth *Cydia pomonella* in apple and pear orchards with mating disruption found that traps with a combination of codlemone and pear ester were effective tools for monitoring codling moth activity in pheromone mating disruption orchards, regardless of pest population level. ■



# fruitgrower products

## Ardmona growers aim high with new advanced production system

Concern over the future direction of the Australian fruit industry has prompted Turnbull Bros Orchards Pty Ltd to move towards a new high production, high quality system for its Goulburn Valley enterprise.

The Turnbull family is targeting consistent 80-tonne per hectare yields and minimum 80 per cent Class 1 pack-out, an enormous jump from current 55t/ha yields and 60 per cent pack-out with their 'Cripps Pink' and 'Rosy Glow' apples.

Brothers Alex, Philip and Chris are the fifth generation on the 1892-established orchard, taking over from parents Ross and Daphne. They grow apples, pears, peaches, cherries and nectarines, with 130ha of the 220ha property currently under orchard production, excluding young trees.

Alex said speculation over the future of the industry, including the impact of imports as well as labour costs and water supply concerns, had led the production change at the orchard to ensure a profitable business for the future.

"We are battling imports that are produced where labour costs are very low compared to Australia. We need to supply a higher quality product with higher yields, and without raising production costs, to compete and be profitable. There is a focus in the fresh industry that lower tonnages produce better quality, but we need to challenge that."

A research trip by Alex and Chris to Washington State in the US was influential in the family's new direction. One of the keys to their move to the higher production, high quality system has been investment in a specialist Netafim drip irrigation system that is automatically controlled by the company's NMC SingleNet unit. This also uses Netafim's FertiKit fertiliser injection system for total nutrient application control. Prior to this the family was applying nutrients through their irrigation system and had previously broadcast fertilisers. Alex said four new production blocks, comprising 15ha, were now being fed via the FertiKit and drip irrigation, while the drip system also had been installed on two existing blocks. An existing mini jet system is watering other areas.



Netafim agronomist Sam Birrell and Goulburn Valley fruitgrower Alex Turnbull among some of the young apple trees on one of the new production blocks established last winter at Turnbull Bros. Orchards. The family is targeting 1.0 metre of vertical growth with the trees over the growing season as part of their new high production, high quality system. They have passed 85 centimetres of growth on average for the year already.

"We are changing over to drip irrigation. We will go drip with any new plantings and wherever we have the ability to do it. We like the low output drip line in terms of getting water use efficiencies. We use a pulse irrigation method to reduce soil compaction, improve capillary wetting and to achieve a continued supply of water to the tree – less water, more often. We also plan to have overhead cooling and netting to improve fruit colour."

The Netafim drip and NMC SingleNet system is achieving significant water savings.

"We estimate that we are saving 45-50 per cent of our usual water application with the new system on the four new blocks. And together with the use of straw mulch, we are saving about 70 per cent. We would normally be watering for 46 hours a week, whereas with the new system we are doing 14 hours a week." He said the NMC SingleNet automation unit had improved irrigation management.

"There is less involved in terms of management by an irrigator. Instead of paying someone to turn taps on and off and switch channels, they are spending more time on crucial things. The system waters from Saturday through to Friday night with low rates and the irrigator puts the whole schedule in on the Friday afternoon and he only needs to check that it is turned on and the fertiliser is going in. We check the filters every two weeks and we flush the system four times a year."

Netafim agronomist Sam Birrell said the full NMC SingleNet, drip and FertiKit system offered a new level of irrigation and nutrition control to orchardists and was now being adopted by an increasing number of growers. The systems also are available separately.

"Fertiliser injection is crucial for growing high quality fruit and drip irrigation works well in all systems to reduce water requirements and better control moisture in the profile," Sam said. Netafim also offers a more advanced automation

system, NetaJet, which comes with EC and pH control as standard and is particularly suited to situations where there are water quality issues. EC and pH control is an option with the NMC SingleNet. Flow meters and pressure sensors also are added options with the systems.

While the Turnbuls are not necessarily saving money on fertilisers per hectare through their new fertigation system, they recognise they are getting much better use out of the fertiliser applied. Alex said in previous times we fertilised three times a year by dumping it in the irrigation pits and then sucking it through a pump in five seconds without knowing that it was getting spread through the block evenly. We are now fertigating five days out of a week.

"We are now pulsing so often – every four hours while it is hot – and so we are able to spread the fertiliser application out over a series of waterings. And we are putting it right where we need it around the root zone. We are applying 25-35 kilograms of fertiliser a week spread over 10 applications of water. We are also watering at times when we are not fertigating. We hope to see with this efficient system that we will be able to reduce the amount of fertiliser we need to use. It is about applying less, more often – applying a little bit all the time to optimise fruit size and colour, but being careful not to over-invigorate the trees."

With the young trees on the four new production blocks established last winter, the Turnbuls are targeting 1 metre of vertical growth over the growing season.

"Consultants were saying that the one metre aim was too large, however we have passed 85 centimetres of growth on average for the year already," Alex said.

Tree density on the new blocks also has been increased, equating to 3000 trees/ha. Alex said this was still too low and by spacing trees 1.2m apart on 4.0m row spacings in future, he could increase this to 4160 trees/ha. ■



## Industry information & horticulture quiz APFIP Weather Station Roundup

**HAL**

Know-how for Horticulture™

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.

Weather Station – Region	Average Temp Min	Average Temp Max	Rainfall for Month	Rainfall to Date 1st Jan
Report period: 17/3/2011 - 15/4/2011				
<b>Batlow NSW</b>	<b>7.2</b>	<b>18</b>	<b>N/A</b>	<b>349</b>
<b>Huon TAS</b>	<b>9</b>	<b>17</b>	<b>38</b>	<b>122.8</b>
<b>Lenswood SA</b>	<b>8</b>	<b>18.7</b>	<b>54.5</b>	<b>158.5</b>
<b>Manjimup WA</b>	<b>12.4</b>	<b>26</b>	<b>31</b>	<b>133</b>
<b>Goulburn VIC</b>	<b>8.2</b>	<b>22.1</b>	<b>44.6</b>	<b>224.6</b>
<b>Yarra Valley VIC</b>	<b>7.9</b>	<b>20.4</b>	<b>89</b>	<b>258.3</b>
<b>Orange NSW</b>	<b>8.1</b>	<b>18</b>	<b>76.7</b>	<b>235.6</b>
<b>Stanthorpe QLD</b>	<b>11.5</b>	<b>22.2</b>	<b>77.1</b>	<b>378</b>

This data is from the APFIP evaluation sites and may not be representative of the total district. Further weather reports and comprehensive variety evaluation reports can be found at the APFIP Australia website: [www.apfip.com](http://www.apfip.com)

## Greg's Quiz

### Question 1:

**True or False:** The United States is the world's largest orange producing country.

### Question 2:

Which of these plants is the most toxic member of the Rose family?

**A:** Damascus Rose. **B:** Black Cherry. **C:** Almond. **D:** Sour Cherry.

### Question 3:

Clearing of pine forests, which acidifies the soil, is recommended as ensuring the appropriate soil type for which crop?

**A:** Potatoes. **B:** Apples. **C:** Lemons. **D:** Blueberries.

### Question 4:

The distinctive "shepherd's crook" of blackened and wilted shoot tips is symptomatic of which pome fruit disease?

**A:** Black spot. **B:** Powdery mildew **C:** Phytophthora. **D:** Fire blight.

### Question 5:

Calcium polysulphide is more commonly known as?

**A:** Calcium nitrate. **B:** Nitropril. **C:** Lime sulphur. **D:** Regalis.



**Answers:**  
Question 1 – False: Brazil is the biggest producer of oranges.  
Question 2 – Answer: B: The Black Cherry (*Prunus serotina*).  
Question 3 – Answer: D: Blueberries.  
Question 4 – Answer: D: Fire blight  
Question 5 – Answer: C: Lime sulphur  
Quiz supplied by Greg Cramond, SA

## State Association Contacts

State	Name	E-mail	Address	Phone
WA	Amy Green	<a href="mailto:amy@fruitwest.org.au">amy@fruitwest.org.au</a>	Fruit West Post address: PO Box 7198 Karawara, WA 6152 Office address: 3 Baron-Hay Court South, Perth, WA 6151	(08) 9368 3869
NSW	Alison Anderson	<a href="mailto:andersona@nswfarmers.org.au">andersona@nswfarmers.org.au</a>	Level 25, 66 Goulburn Street, Sydney, NSW 2000	(02) 8251 1872
QLD	Michael Cowan	<a href="mailto:mcowan@growcom.com.au">mcowan@growcom.com.au</a>	Growcom Floor 1, 385 St George Terrace Fortitude Valley, QLD 4006	(07) 3620 3861
SA	Greg Cramond	<a href="mailto:aplpear@ozemail.com.au">aplpear@ozemail.com.au</a>	Apple & Pear Growers Association of SA PO Box 74, Basket Range, SA 5138	(08) 8389 8300
TAS	Sally Tennant	<a href="mailto:sally@fruitgrowerstas.com.au">sally@fruitgrowerstas.com.au</a>	Fruit Growers Tasmania Inc 262 Argyle Street Hobart, Tasmania, 7000	(03) 6231 1944
VIC	John Wilson	<a href="mailto:gm@fgv.com.au">gm@fgv.com.au</a>	Fruit Growers Victoria 2 Rumbalara Road, Mooroopna, VIC 3629	(03) 5825 3700



The only Industry magazine published 11x a year by the Apple, Pear and Summerfruit industries' Peak Industry Bodies – Apple & Pear Australia Limited, and Summerfruit Australia Limited.

A U S T R A L I A N  
**fruitgrower**  
VOL 4/ISSUE NO. 8  
SEPTEMBER 2010  
www.apal.org.au  
www.summerfruit.com.au

Avoiding core rots



A U S T R A L I A N  
**fruitgrower**  
VOL 4/ISSUE NO. 9  
OCTOBER 2010  
www.apal.org.au  
www.summerfruit.com.au

Summerfruit's coming season and export potential



Riverland  
Future

A U S T R A L I A N  
**fruitgrower**  
VOL 4/ISSUE NO. 10  
NOVEMBER 2010  
www.apal.org.au  
www.summerfruit.com.au

Aussie Apples  
2010 campaign success



Diverse experience leads PIPS pest program  
Productivity Commission report – how it affects your industry R&D

THE OFFICIAL MAGAZINE FOR APPLE, PEAR AND SUMMERFRUIT GROWERS IN AUSTRALIA

A U S T R A L I A N  
**fruitgrower**

### Advertise in Australian Fruitgrower

- Distributed by name to all recognised levy-paying growers in the Apple, Pear and Summerfruit industries
- The most efficient and cost-effective way to reach this target market
- Funded and driven by growers for growers and therefore read by growers
- Advertising is complemented by technically validated and seasonally relevant editorial content.

### Subscribe to Australian Fruitgrower

- Frequent industry news, reports, and reliable technical articles
- Qualified and respected content technical reference team
- High quality colour reproduction and printing
- Engaging, readable format and informative graphics
- Each issue mailed personally – ideal for extra enterprise copies and personal news and industry reference for non-levy paying Industry Associates.

**Contact:** editor@apal.org.au or 0418 552 541