

# **Horticulture Innovation Australia**

## **Final Report**

### **Australian Stonefruit Grower Magazine 2016**

Gordon Rogers  
Applied Horticultural Research Pty Ltd

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SF15003

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## Summary

The summerfruit industry in Australia is geographically diverse, ranging from Queensland to Tasmania along the east coast, as well as including orchards in South Australia and Western Australia. The aim of this project has been to communicate with this varied group, informing them about new research, industry news, events and other issues affecting summerfruit growers across the country.

The initial task was to rejuvenate the Australian Stonefruit Grower magazine, giving it a fresh and modern look. In consultation with industry and HIA, a design was selected with a summerfruit based colour palette, new banner header, fonts and logo.

Four editions of the new look magazine have been produced. These have had a strong emphasis on clear and concise reporting of research results. The aim has been to clearly identify how such research can be used by summerfruit supply chain businesses. Examples include new technologies to control fruit fly, use of deficit irrigation to improve fruit quality, accurate measurement of fruit maturity before harvest and novel products to extend storage life.

Articles have also focused on specific issues affecting summerfruit growers. The advent of China as a new export market has been a particular focus, as well as progress of the SITPlus program for fruit fly management. Innovative or unusual businesses have been profiled, such as Californian stonefruit growers, the company behind the Queen Garnet plum success and how orchards are managed in the contested Golan Heights area of Israel.

The communications survey has confirmed that growers want to hear about research results, but concisely and in a form they can use. They also prioritized articles on specific topics, and were less interested in news and export data. The survey found that the Australian Stonefruit Grower magazine was a preferred method of communication, along with the summerfruit newsletter and direct email, particularly for technical information. The majority of respondents stated they were either very satisfied or satisfied with current industry communication, with only 5% registering that they were dissatisfied.

It is recommended that the Australian Stonefruit Grower magazine continue, along with the Summerfruit Australia website and email news service. These should continue to focus on new technologies and research, making clear information available to growers.

Opportunities to link with other industries to conduct joint regional activities should also be explored. Given the strong interest in research results, this could take the form of an annual technical roadshow. Such an event would facilitate linkages between researchers and growers, as well as ensure current and future research projects are focused on industry needs.

## **Keywords**

Stonefruit, summerfruit, magazine, communications, survey, peach, nectarine, plum, apricot, research report

# Introduction

The Australian summerfruit industry includes growers of peaches, nectarines, apricots and plums. The industry is geographically diverse, as different varieties and microclimates mean that summerfruit can be successfully grown from the high altitude Queensland granite belt to the cool and damp of southeast Tasmania and the hot, dry Mediterranean climate east of Adelaide and south of Perth.

The diversity of the industry means that the challenges faced by growers are many and varied. For example, fruit fly management is a major issue for low chill growers in NSW, Queensland and WA. However, those in SA and Tasmania are unaffected. Conversely, export opportunities are most interesting to large producers in Victoria and South Australia, whereas NSW growers tend to be focused on the domestic market. Water availability, market access, increased climate variability, attracting seasonal workers and changes in consumer preferences are just a few of the many issues currently facing summerfruit growers.

Regular provision of clear, usable, information is therefore an important part of helping summerfruit growers manage their businesses. This has previously been achieved by printed magazines (originally produced by the low chill stonefruit industry), emails, field days and more recently an electronically distributed magazine.

This project has aimed to continue and enhance this service, providing summerfruit growers around Australia with the latest industry news, research results and available technologies. There has been a strong focus on applied research, which can be used directly by supply chain members to streamline production, improve postharvest management or access new markets.

Another aim has been to assist development of a communications plan for the future of the industry. A survey has been conducted of industry members to determine what services they value, and which are less useful. The results are used to recommend future communications activities.

# Methodology

Four editions of the Australian Stonefruit Grower magazine have been produced.

A new format was developed with a professional designer, featuring a new, bright modern look. Theme colours appropriate to stonefruit were selected, including golden orange, plum, and lime green. A new banner title was designed for the magazine, along with pullout boxes, header styles and other features which give the magazine a distinctive and standout appearance. Regular sections include;

- Editorial
- Reports
- News
- Feature story / stories
- Research results
- Industry contacts

There has been a strong focus on research results, particularly those that have been conducted through HIA using industry levies and matching Australian government funds. Articles on research outcomes were either written by the editor using materials and information supplied by the researcher (eg. Journal paper, final report), or contributed by the researcher themselves and simply edited for clarity.

In all cases there has been a strong emphasis on using clear language to explain trials and data, presenting straightforward, readily understood graphs and pictorial illustrations of results. Benefits have been described in terms of how the work can be used by summerfruit businesses to improve their practices.

The magazine was then circulated to levy payers using the Summerfruit Australia contact email list. Two versions of the magazine were provided;

- A standard pdf with low or medium resolution, suitable for easy download
- An interactive pdf created using Joomag software, which included page turning, live links and other features simulating a hard copy magazine, designed for reading on tablet or ipad.

## Outputs

Four issues have been produced of the Australian Stonefruit Grower magazine, corresponding to [May 2016](#), [August 2016](#), [December 2016](#) and April 2017. A copy of the final, April 2017 magazine is included as Appendix 2 in this report.





# Outcomes

## The magazine

Growers have been informed about the latest stonefruit research, both levy funded in Australia and results from overseas. Examples include;

- New varieties available for trial that have been produced through the low chill breeding program (Bruce Topp and Mark Napper)
- The DA-Meter for measuring fruit maturity. An initial write up on the project was followed by detailed description of the protocol for measuring ethylene to calibrate the DA meter, how to make and operate the equipment necessary and links to more information plus videos on using the device (Dr Dario Stefanelli and Christine Frisina)
- Ladd traps for monitoring fruit flies (Dr Mark Schutze)
- SPLAT CL as a new method targeting male Queensland fruit flies in orchards (Dr Peter Crisp)
- Best practices for managing brown rot in orchards, including the weather conditions that increase the risk of the disease and pre and post harvest strategies to reduce development (Dr Oscar Villalta)
- Using bees effectively to increase pollination (Dr Doug Somerville)
- Low dose fumigation of nectarines, as a unique protocol which is now allowing Australian fruit to access the Chinese market (Dr Pauline Wyatt)
- Use of mild irrigation deficits to improve fruit quality (derived from recently published Spanish research)
- Traps using UV light to attract fruit flies (combination of overseas research and a local project on vegetables by Dr Jenny Ekman)
- Using 1-MCP (SmartFresh) to extend storage life of stonefruit (review of a number of overseas research papers and local data supplied by AgroFresh)

Growers have also been able to read news items relevant to the industry, including information on weather, export volumes, changes in government policies (eg the 'backpacker tax') and availability of funding for specific activities (eg the authorised officer program). The regular columns from Summerfruit Australia CEO and chairs of the high chill and low chill branches of the association (Andrew Finlay and Mark Napper / Rod Dalton) have ensured that growers are also aware of recent developments in the new Chinese market as well as different domestic regions. The columns from John Moore have been particularly topical, providing information on the quality of Australian (and Chilean) fruit arriving in China, how the market works in that country, and new opportunities for next season.

Other examples include;

- The Queen Garnet plum story – a good news story for stonefruit.

- The SITPlus program, including development of the facility (Dan Ryan).
- The Area wide management program for fruit flies, with a series of articles including principles of AWM, monitoring programs and fruit fly movement in the landscape (Dr Penny Measham).
- Irradiation for access to export markets – profile of Steritech.
- Threat from the brown marmorated stink bug, an exotic pest recently found in New Zealand

The magazine has also included profiles of specific businesses that are likely to interest Australian growers;

- The Californian stonefruit industry, focussing on specific practices used by the industry to maximise yield and quality, and new varieties being grown.
- The Good Rich Fruit company – producers of the high value Queen Garnet plum
- Professional beekeeping – Elizabeth Frost
- Jon Nathan, a stonefruit grower living in the Golan Heights, Israel.

## Communications survey

At the time of report preparation, 38 responses had been received to the communications survey. Of these, 74% were growers or grower/packers, with the remainder including retailers, agronomists, exporters, marketers and researchers. Half of all the responses were from Victoria, followed by SA, WA, NSW, Queensland and Tasmania in order of number of replies.

The Australian Stonefruit Grower magazine, along with the Summerfruit Australia newsletter and direct email, was the most highly ranked among all of the communication channels that could be used to communicate with the industry. The Summerfruit website had a mixed response, while social media, roadshows and SMS were ranked low.

Half of all the respondents took the time to suggest other ways of creating effective communication channels. Many liked the idea of joint conferences or field days, whether with Apple and Pear Australia, Cherry Growers or even the nut industry. One suggested regional networks similar to the citrus industry 'Citi Groups'. Others suggested that adopting a project similar to APALs 'Future Orchards' would fill a clear gap.

There was a clear bias to regional events as part of technical roadshows rather than a more centralized workshop or conference. For example one grower commented;

*"We need to get researchers out there, out of the Tatura Institute or faraway labs, working on subjects decided by us growers, to come and report to farmers in rural areas...but first they need to stop reading their Power Point presentations and talk WITH us."*

Another said;

*"Joint events with apple and pear are a great idea. Most areas have both crops and it*

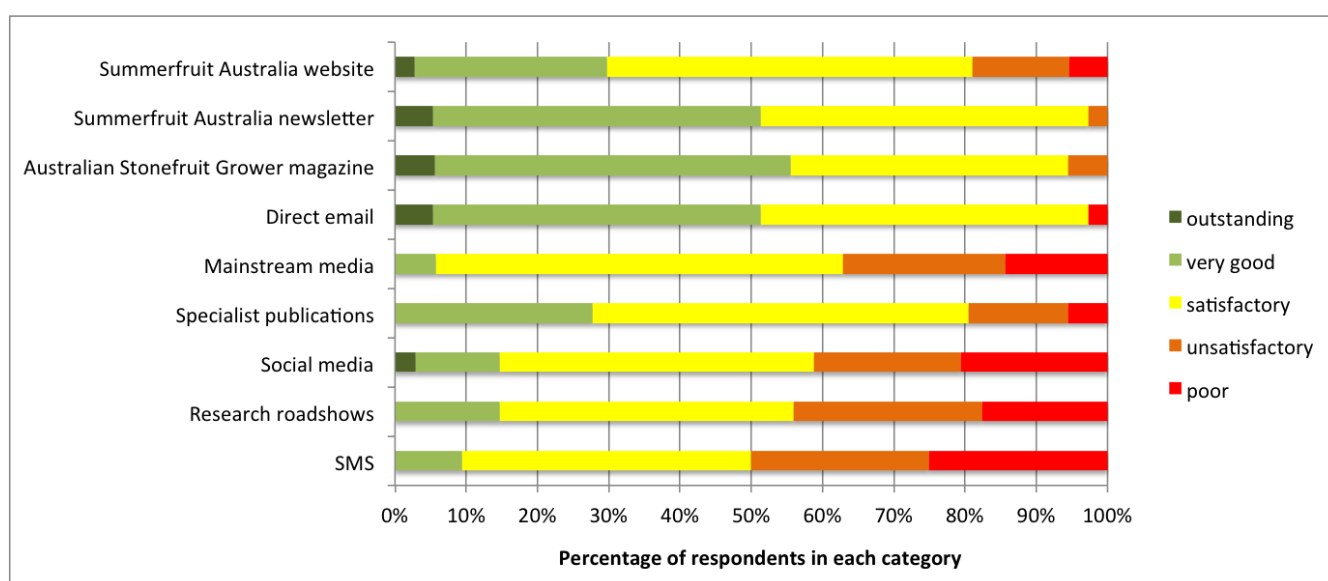
*would be win-win if resources could be pooled."*

Also;

*"An annual roadshow visiting all regions. Provides an update on current issue and gathers feedback and comments from growers."*

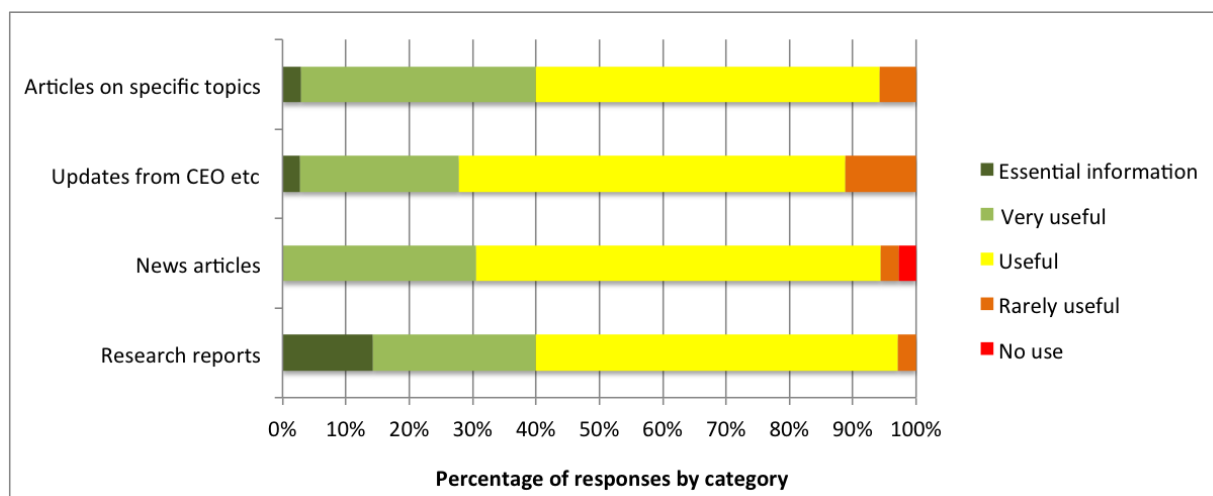
Most (78%) of respondents said they read the magazine. Those that didn't said that this was either because they had never seen the magazine, or that they just didn't have time to read. The new format was rated very good by most respondents, although it should be noted that many skipped this question or answered 'don't know'. This suggests that respondents may not have been receiving the previous version of the magazine, and/or were unaware of the change in style.

Similarly, the majority answer to a question on videos was 'don't know / haven't seen', reflecting that this material was not as widely distributed as intended.



**Figure 1. Rating of the effectiveness of different communication channels by summerfruit industry members.**

Interestingly, the most highly valued type of information were reports on new research, whether in the magazine or on the Summerfruit website. For example, over 76% of respondents wanted to see more research information on the website. This perhaps reflects the history of the Australian Stonefruit Grower magazine as a conduit for technical information, a development initiated by Dr Barry McGlasson in the 1990's. Articles on specific topics were also valued. News and editorials appeared to be less important, even though still useful – probably because this information is readily obtained from sources such as FreshPlaza and the rural media.



**Figure 2. Topics of most value to summerfruit industry members.**

Opinions was split approximately 50:50 on whether monthly updates would be a useful supplement to the Australian Stonefruit Grower magazine. Most respondents were either very satisfied (11%) or satisfied (54%) with current summerfruit industry communications. Only around 5% declared that they were dissatisfied with the current situation. Comments to improve communication included increasing the amount of technical information, ensuring information was concise and direct, and reducing the focus on the east coast to make the magazine more inclusive.

The full results of the communication survey are included as Appendix 5 to this report.

## Evaluation and Discussion

The project has achieved its primary objective of producing four issues of the Australian Stonefruit Grower magazine. The magazine has been written and designed to a high, professional standard and provided to growers as both an easily downloadable pdf and as an interactive version with page turning and other features suitable for use on a tablet or ipad.

Although direct feedback on the magazine has been limited, the results of the communications survey seem to confirm that growers value the magazine as a source of information, particularly as a way to learn about new research. It should be noted that two of the research articles in the latest edition – on the use of light to trap fruit flies and the use of 1-MCP to extend storage life of stonefruit – were both written at the request of industry members who wanted to know more about these technologies. In this case, the articles not only included recent Australian research, but put this into an international context by briefly reviewing the international literature on the topics.

It seems clear the Australian Stonefruit Grower magazine is a key mechanism for communicating the results of industry-funded research. This ensures that growers understand how and where the levy money they contribute is being spent as well as how it can add value to their business.

Discussion of the magazine with industry members also indicated that they were interested in how things were done in other countries, or by innovative local producers. This impression was supported by the results of the communication survey, which showed that growers were keen to read articles on specific topics relevant to their businesses. The article on the Californian stonefruit industry interested many, while exporters will have learned many valuable insights from John Moore's reports from China.

One of the issues encountered during the project was incomplete distribution of the magazine electronically. Key industry members contacted for feedback were initially not receiving the magazine and were unaware of the new format etc. Finding ways to ensure that email addresses are updated, the distribution list is complete and that the magazine is distributed as widely as possible would greatly increase its usefulness to industry members.

## Recommendations

- That the production of The Australian Stonefruit Grower magazine as an e-newsletter continue on a quarterly basis.
- That new methods for distributing the magazine be investigated to ensure it is reliably provided to all levy payers as well as service providers and summerfruit industry supply chain members.
- Future editions of the magazine must continue to have a strong focus on communicating the results of research projects and technical data, as well as including articles on specific topics of interest. Articles need to be able to describe technical information clearly and concisely, such that summerfruit growers are able to potentially apply the results in their own businesses.
- Opportunities to link with other industries to conduct joint regional activities should be explored. Given the strong level of interest in research and technical information, this could take the form of an annual technical roadshow. Such an event would facilitate linkages between researchers and growers, as well as ensure current and future research projects are focused on industry needs. An alternative would be a one day technical meetings with research presentations (as conducted by APAL) in a central location.

There does not appear to be strong support for increasing newsletters and other information sources. Rather, growers appear to prefer continuing the current system with emails for events and news, with more technical information reserved for the magazine.

## **Scientific Refereed Publications**

None to report

## **Intellectual Property/Commercialisation**

No commercial IP generated

## **Acknowledgements**

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John Moore – CEO

Andrew Finlay – Chair of Summerfruit

Mark Napper / Rod Dalton – President of Low Chill Australia

Also, we acknowledge the researchers, extension staff and others who have contributed articles, photographs and ideas for publication.

## **Appendices**

1. Australian Stonefruit Grower April 2017
2. Communications survey report



# **G** *Australian Stonefruit* **rower**



Issue 1 | 17  
April 2017

## **Growing fruit in Israel**

**Beewoman**

**Stink bug tourists**

**Flies see the light of die**

**Rain wrecks apricots**

**plus**

**All the latest  
research**

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*Australian Stonefruit Grower* is the official publication of Summerfruit Australia Ltd & Low Chill Australia Inc. – the industry bodies representing the interests of Australian stone fruit growers



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**COVER PHOTO:** Yonatan and Nadav Henig from Avnei Eitan Moshav on the Golan Heights, enjoying a ripe peach from their grandfathers' orchard.

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# Season of change

Welcome to our first anniversary issue of the new-look Australian Stonefruit Grower. As the last few plums disappear off the supermarket shelves it is probably a good time to think about the season just gone.

It has certainly been eventful, with the ongoing struggle to control fruit fly without chemicals, new markets in China and both droughts and flooding rains – in the case of the NSW / Queensland border, within a very short range of each other.

This issue features an interview with Israeli stonefruit grower Jon Nathan from the Golan Heights. It is hard for us in Australia to imagine what it must be like growing fruit in such a hotly disputed area, within view of the Syrian border. However, his concerns are much the same as many Australian growers: managing pests, difficulties with the weather, effective use of scarce irrigation water and the availability and cost of labour. Perhaps what is striking are not the differences, but how much remains the same.

We also discuss a couple of new technologies; using UV light to attract and kill fruit flies, and postharvest application of 1-methylcyclopropene or SmartFresh.

Most will be familiar with backyard bug-zappers. These can attract and kill all sorts of unwelcome evening visitors. So what about fruit flies – can they attract them too? New research by Macquarie University has examined whether fruit flies are attracted to different types of light. The results suggest that UV light could indeed provide a new way to monitor flies, especially if combined with other attractants.

SmartFresh is used extensively in the apple and pear industries to maintain firmness during storage and

shelf life. It has revolutionised how we manage apples. In Australia, SmartFresh is registered for plums and nectarines. However, harvest maturity and variety greatly affect the results. Understanding how SmartFresh works will help growers and packers decide whether it is a saviour or a surplus.

Finally, **many thanks** to those who have already filled out the Summerfruit Australia Communications Survey. Your responses and opinions will help determine how your industry communicates with you in the future, including emails, website and the continuation of this magazine.

If you haven't already completed the survey, it's still available at <https://www.surveymonkey.com/r/Summerfruit>. It's your levy money – make sure it gets spent on the things you want.

-Jenny Ekman





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# China's huge online fresh fruit market

As we finish the first ever season of exports to China, it is perhaps a good time to both take stock of how things went and also to look for new opportunities.

I was fortunate to be able to attend PMA Fresh Connections in Shanghai, held 15 – 17 March this year. Unlike some other PMA events this was not a trade show, but an opportunity to learn more about the Chinese market and conduct business-to-business meetings with importers and retailers.

The event included some excellent presentations about trends in the Chinese market, and perhaps globally as well. I will post these into the members section of the website, or can supply to summerfruit levy-payers on request.

### Fruit online

One of the major changes is in the growth of e-commerce. One in five Chinese households is already buying fresh fruit online. This is predicted to more than double within the next 12 months, increasing to 45% of households by the end of 2017.

Each month 450 million consumers visit online stores such as Alibaba.. On average, they return to review their prospective purchases at least seven times, but then buy an average of 19 items. Even at 11pm at night there are still an estimated 70 million consumers looking for products to buy.

Online shopping purchases are very sensitive to price and quality. Products are seldom bought on impulse, with consumers checking the product several times before buying. Despite these barriers, supermarkets are fighting falling sales as online shopping grows.

Alibaba owns Tmall Fresh, believed to be the largest online site for fresh products in China. It already has 500,000 customers, with a combined spend of around A\$58

“One in five Chinese households is already buying fresh fruit online. This is predicted to more than double within the next 12 months, increasing to 45% of households by the end of 2017.”

# CEO's Report



PMA Fresh Connections conference in Shanghai was an opportunity to learn more about behemoth Chinese market.

million. The group is expanding its presence, with plans to open 1,000 community stores across China. It is claimed this will allow purchases to be delivered within 10 minutes of sale to households within 3km of the store.

## Guaranteeing providence

Two of the drivers for online purchases of fresh fruit is continued strong demand for imported products (51% of consumers) and the importance given to products having guaranteed providence. For example, Tmall Fresh has a policy of sourcing products from GlobalGAP certified (or equivalent) producers, ensuring goods meet minimum standards for food safety and quality.

Chinese consumers want to know the story behind the product – where it has come from, how it was grown. Pictures or videos of the grower, their family, how the fruit is grown and harvesting and packing processes have strong resonance. For example, live streaming fruit packing from the farm, preferably with Chinese commentary or pictures of Chinese children eating the fruit, is likely to be highly effective for promotion.

As part of this desire for the genuine, there is strong demand for products in original packaging such as large punnets or clamshells. While pre-packing clearly adds to labour and transport costs, this may be compensated by higher prices for such products. (NB. packaging must include holes to allow MeBr fumigation.)

As a minimum, all products should have clear and distinctive branding on the cartons. Generic boxes just



New packaging ideas on display.



## CEO's Report

don't cut it; Chinese want to see brands that they recognise and trust.

QR codes are another important way to provide information to consumers. QR codes can link to information on the farmer, growing method, location, crop history, cut fruit samples and even recipes or quality data including brix levels. Consumers can give feedback through the QR labeling site, hopefully expressing satisfaction.

There are methods to prevent counterfeiting of QR labels by including images and linking each code to a unique product. Such systems are already used widely by Metro chain stores as well as by Alibaba itself.

One of the presentations was by the company SafeTraces (formerly DNATrax). Non-living, tagged DNA particles

“  
Linking with northern hemisphere partners would not only gain us better access into Chinese markets, but extend the supply of specific, branded products.”

are included in the fruit washes or coatings. The product can later be scanned to detect the tagged DNA, bringing up complete traceability information.

Linking with Chinese farms.

There has been much publicity in recent times regarding Chinese companies purchasing Australian farms. New regulations now require companies to gain Chinese

government approval before purchasing overseas assets. Large purchases – such as the proposed sale of avocado orchards in Western Australia – also require approval from the Foreign Investment Review Board. Small Medium Enterprises are already established within stonefruit, table grapes and of course citrus.

However, joint ventures with Chinese companies can



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take many forms. Many Chinese companies are importing agricultural systems and practices from countries such as Australia. There are opportunities to develop linkages with such companies, to the benefit of both parties.

Australia is not alone in this desire – China has Free Trade Agreements with 11 countries, including Chile, Peru and Costa Rica. However, we have a reputation for both quality and value for money.

Linking with northern hemisphere partners would not only gain us better access into Chinese markets, but extend the supply of specific, branded products.

As China enters the second year of its 13th Five-Year-Plan, China's rapidly growing middle class is searching for innovative products which combine quality and safety. With increasing imports, more second and even third tier cities are acquiring the type of CIQ customs clearance systems that were once held exclusively by cities such as Beijing, Shanghai and Guangzhou. Direct flights into such cities mean that Australian stonefruit has market opportunities as never before.

Here's hoping we have a better 2017/18 season for really establishing Australian stonefruit and be mindful of the



Participants at Fresh Connections Shanghai (including John Moore at centre of image - ed).

lessons learnt; send quality fruit, well branded and not inferior brix fruit looking for a quick buck. As I have said the Chinese consumer is a very discerning buyer very familiar with new technologies and interactive media. Industry must take responsibility for the International stage we now share with Chile, distinguishing our choice premium quality stonefruit from the bulk mass of Chilean stonefruit.

- John Moore

## See your levy in action

*Hortlink* is Horticulture Innovation Australia's quarterly publication delivering a detailed overview of your levy at work. Each edition is packed with essential, easy-to-read info for growers, including:

- Details of new, ongoing and recently completed R&D projects for each levy industry
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## Fruit flies under control

Up here in Queensland we finished our stonefruit season weeks ago. But that doesn't mean there isn't still plenty to be done.

We grow persimmons as well as stonefruit, and at this time of year we are trying to get the fruit off the trees as fast as possible. The really encouraging news is that so far, despite processing many tons of fruit, I have seen a total of only two persimmons with fruit fly stings!

As many would know, persimmons are a very attractive host for fruit flies. Sting marks show up as a distinct and very obvious black mark. They are hard to miss. Normally we tell the pickers to pull off and dispose of any fruit with visible sting marks. However this year the stings are so rare we haven't needed to do that.

We used to control fruit fly with regular sprays of Lebaycid. Monitoring traps outside the orchard are still catching 6 to 10 flies per week, so they are certainly still around in the outside environment.

However, despite using no cover sprays at all this season, inside the orchard we don't catch any flies. It seems clear that the combination of protein baiting, MAT and hail net with sidewalls really are keeping our crop fruit fly free.

Dan Papacek from 'Bugs for Bugs' recommends keeping some bait around during winter – just in case there are a few warm days and females start to emerge. You don't have to apply as often, but it's important to keep bait available. We will certainly keep up bait applications. After all, if there are no flies left after winter it will greatly slow down the buildup of the population in spring, when the weather warms and the orchard is starting to set fruit.

Weather certainly creates plenty of challenges. It may surprise some to know that here in south-east Queensland the ground is still very dry. While about 100mm of rain fell locally during the recent storms, it wasn't enough to get the creek running behind our property. The creek is what recharges the local aquifer, so water supply is really critical. Other areas, extending up to Stanthorpe and into the granite belt are much the same.

At the same time, other low chill growers have had far too much rain. While most of the orchards are on slopes, so probably not flood affected, heavy rain and waterlogging are clearly not good for stonefruit trees.

The impact of the storms on orchards will only become clear next spring, once the trees start to come back to life. Our thoughts are certainly with those growers affected, and hope that there aren't too many ill-effects.

– Rod Dalton



Elizabeth Frost has been stung some 200 times, but her love affair with bees continues unabated.

Photo: Kathy Keatly Garvey



# Beekeeper

*This profile first appeared in the Maitland Mercury and is here reproduced with permission.*

In the last issue of *Australian Stonefruit Grower* we featured story which described the role that honey bees play in pollination of crops, stone fruit among others. Here, **Rick Allen** profiles a professional beekeeper, Elizabeth Frost.

Elizabeth's Frost's enthusiasm is palpable. "Want to try some," she asks in her northern Californian accent, as she dips in her forefinger, gives it a quick twist and then sips the golden nectar.

She holds the frame out for me to try.

But there's a problem. I'm in protective gear – a sort of cross between Ned Kelly and an Ebola nurse. Headgear, netted at the front and zipped at the neck, long sleeved white jacket and thick gloves that go up to my elbows.

It's poor form to get your interviewing journalist stung by bees.

With Elizabeth's help – a quick unzip here, off with the glove there – I dip my finger into the honey cells, find the

gap under my headwear and taste. It's not as thick as I would have expected, but deliciously sweet.

"It's a touch cold today, so the honey's not as warm and runny as usual," she says. "A pity."

We're in a partly shaded area between trees at the back of Tocal Agricultural College, where Elizabeth, honey bee development officer with the NSW Department of Industries, is showing me her hives and trying to explain this beekeeping caper.

But first, let's talk about Elizabeth and her journey from the Bay area of San Francisco – "Silicon Valley, really" – to the Hunter Valley.

"I've always been passionate about insects," the 28-year-

## Feature

old says. "I loved agriculture, and pests and labs, that sort of thing."

"Then, when I went to the University of California (Davis), I did some volunteer work in the bee lab and I was hooked. I found honey bees fascinating and the value of pollination is huge to the world."

After uni she got a job as a travelling beekeeping technician, which meant a lot of long days travelling through Minnesota and North Dakota working with commercial beekeepers, but hankered for something different.

So here she is.

"It's temporary, a nine-month contact," she says. "I'm creating vocational educational tools for beekeepers with Tocal College's Educational Delivery Team and really enjoying it. Ideally I'd like to stay on."

So let's cut to more important matters.

“  
The European honey bee  
(species *Apis mellifera*  
to be exact) is not  
native, but is the one  
that pollinates a vast  
number of crops, fruits  
and vegetables, and the  
lucerne that feeds cattle  
which ends up on  
your burger.”

### Passion

When she goes to a party and tells people her passion is bees, do they look at her like she's a geek. Or is she suddenly the life of the party?

She chuckles. "I haven't been asked that before," she says. "But overall I'd say it's positive because everyone has a reaction. Some people are scared of bees, others find the whole idea interesting, and some use it to talk about their favourite honey."

If that question surprised her, the next wouldn't – but I have to ask.

How many times have you been stung?

There's a brief pause. "Probably 200, I'd say. At first when I was stung on the finger it was quite painful and my whole hand would swell up, but not any more."

"I guess I've desensitised – although not everyone does. It's important that you get the sting out straight away. It's

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barbed and you have to scratch it out – don't squeeze it, that just squeezes more poison into your system. Also it's true that the bee dies when it stings you which is pretty sad."

For someone who has been stung as many times as that, Elizabeth is remarkably gung-ho about the prospect.

While I'm all covered up, she wears no gloves as she inspects the hives – "it's more tactile without gloves" – pulling out frames of honey.

She notices hive beetles in the frames, which are a native of Africa and were introduced to Australia accidentally, probably in soil. They are a pest and she starts squashing them individually with her thumb or forefinger – whatever's closest – at breakneck speed, missing the bees by millimetres.

Her sting count will be 201 before the day's out at this rate, I think to myself. But sure enough, she manages.

"So, tell me about bees," I say in what was the broadest question I could come up with, informing her that, like most people, my entire knowledge of bees is that they sting, occasionally swarm, produce honey and I now know officially that they die when they sting.

And off she goes, telling me about a social structure that seems to flog the females to death while the boys sit back and watch, how their sex lives would put Hollywood Housewives to shame, what it takes to make a bee happy, and the requirements of good beekeeping.

## By the numbers

"There's 1600 species of native bee in Australia, of which 14 are stingless. The European honey bee (species *Apis mellifera* to be exact) is not native, but is the one that pollinates a vast number of crops, fruits and vegetables, and the lucerne that feeds cattle which ends up on your burger. They produce more honey and reproduce more readily than others and is overwhelmingly the choice for



**Beekeepers must always leave some honey in the hive to sustain it.**

Photo courtesy [www.talkingwithbees.com](http://www.talkingwithbees.com)

beekeepers. In spring, one colony can contain up to 50,000 bees in spring."

There are 3445 beekeepers in NSW, and annually Australian produces 25,000 to 30,000 tonnes of honey.

I ask if Elizabeth has become a honey snob in her line of work. She pauses a second.

"Well, I always have a stash at home of three or four varieties," she says. "I'll try one depending on my mood.

"I usually end up buying directly from a beekeeper or at a farmers market."

I ask her if she has it with toast. She's unimpressed.

I guess it is like asking a lover of single malt whisky if he has it with coke, or a wine man if he puts ice in his chardonnay.

"No," she explains. "Just a spoonful, nothing else, although sometimes I'll make ice cream with it."

I decide to get her back to bees.

## Hive of activity

For a happy hive you need warmth, shade and nearby water. As bees are sensitive to temperature, this may entail moving the hive depending on the season. A hive left

exposed to the summer heat - or where food supplies are short - will mean tetchy bees. Sting time.

The queen bee is determined by diet. "They are fed what's known as royal jelly ... think of it as bee milk. The other females are fed royal jelly to start with, then switched to worker jelly. Royal jelly lite, I assume.

The hive might produce more than one queen, but the first queen to emerge will immediately sting and kill the others.

## Swarms

A swarm arises in good times when there's enough food and water to sustain another hive. In that case a second queen bee will be produced, and fly off taking half the hive with her - a swarm.

Beekeepers need to walk a fine line, leaving enough honey in the hive to sustain it, should hard times occur when food sources are scarce. At the same time, if they leave too much honey in the hive, bees will take it as a sign that times are good and it will almost invariably lead to a swarm.

## Worker bees

Bees won't leave the hive if the temperature is below 13°C or it's too windy. If it starts raining they will return to the hive. Whoever their union rep is, he's good.

Aside from the queen bee, the hive is made up predominantly of females which are divided into foragers, and those that stay in the hive. Foragers fly within a 5km radius, collecting pollen and nectar - pollen is their first choice because it has a higher sugar content.

## Production line

Back at the hive they pass it to the worker bee in the hive through what's known as trophallaxis - the movement of food from one mouth to another. The in-hive workers deposit the nectar in a cell while the forager heads back out. To ripen honey in the hive workers will flap their wings to create an air flow, to evaporate the water content in the nectar, making it more viscous. When the cell is full they will put a cap on it to preserve it. Voila! A bee production line.

## The males

All the time the male bees, the drones (of which there are a few hundred compared to thousands of females), just sit back, are fed by the females, and watch the action. Occasionally they fly off looking for a virgin queen bee to seduce - as you do.


It sounds a cushy job, but there's a catch. When the male does find a willing queen bee, they mate in mid-air, which no doubt brings its own complications. But here's the catch.

"The male has what's known as an endophallus - in layman's terms, an inverted penis," Elizabeth explains, scrunching her nose up. "When they mate, the penis breaks off and is embedded in the queen. The queen then mates with other drones, usually about 12."

So, what happens to the poor penis-less male who up till five minutes ago was enjoying the life of Riley. Does the old fella grow back, for starters?

"His internal organs are ruptured when the penis breaks and he dies."

And that, ladies and gentlemen, is called going out with a bang.



Some of the cells in a hive contain honey, while other are used to provide a nursery for the next generation of bees.

Photo courtesy [www.talkingwithbees.com](http://www.talkingwithbees.com)

## More Information

The Department of Primary Industries has two new online beekeeping publications - "Healthy Bees" and "Bee-Ag Skills", available at [www.tocal.nsw.edu.au/publications](http://www.tocal.nsw.edu.au/publications).

More information on a huge range of beekeeping topics is available at [www.dpi.nsw.gov.au/agriculture/livestock/honey-bees](http://www.dpi.nsw.gov.au/agriculture/livestock/honey-bees)



## Stink bug alert

Photo courtesy wikimedia commons

Brown marmorated stink bug (BMSB) *Halyomorpha halys* has been spotted in a New Zealand hotel. Which is too close for comfort for Australian orchardists.

### NZ hotel cleaners praised after discovering pest

THREE motel cleaners have been hailed as heroes after spotting the brown marmorated stink bug, which is a pest with the potential to cause widespread damage to New Zealand's horticulture industry. James Trevelyan, the managing director of Trevelyan's Pack & Cool Ltd, and a long-time kiwifruit grower in Te Puke, said the cleaners found the brown marmorated stink bug in separate discoveries in Christchurch, Whitianga and New Plymouth earlier this year. Investigations by the Ministry for Primary Industries concluded the bugs hitch-hiked here in luggage from predominately American visitors.

- NZ Herald

Some pests can sneak through quarantine and it might not always be imported products that are to blame but holidaying tourists.

The brown marmorated stink bug is a particularly difficult pest to manage. Unusually for stink bugs, the adults commonly invade structures and homes during winter, sometimes in large numbers. There they search for somewhere to hibernate. Suitable places include shipping containers, packing materials and, presumably, suitcases in people's homes and in hotels.

Once the bugs warm up they become active – and hungry. Like other bugs they are sap-suckers and can feed on a very large range of hosts. The adults are strong fliers, able to travel more than 2km per day, while nymphs walk and climb, covering 20m across grass in less than five hours<sup>1</sup>.

Originally from Asia, during the last 20 years BMSB has spread to many parts of Europe and throughout North America.

Whereas other stink bugs feed on leaves and stems, both nymph and adult BMSB feed directly on orchard

fruit. Feeding causes shallow dimples on the outside of fruit, with white or brown necrotic areas just under the skin. Attacks during early season have the greatest impact, with injuries extending right into the core of the fruit<sup>2</sup>.

BMSB invasions have caused complete loss in USA orchards in the Mid Atlantic region. This clearly a pest we don't want in Australia.

Perhaps – like in NZ – we should also be training our hotel cleaning staff in how to spot these small, brown, and stinky invaders.

<sup>1</sup> Lee D.-H, Nielsen AL, Leskey TC. 2014. Dispersal capacity and behavior of nymphal stages of *Halyomorpha halys* evaluated under laboratory and field conditions. *J. Insect Behav.* 27:639-651.

<sup>2</sup> Acebes-Doria A, Leskey TC, Bergh JC. 2016. Injury to apples and peaches at harvest from feeding by *Halyomorpha halys* nymphs early and late in the season. *Crop Prot.* 89:58-65.



Photos: Jon Nathan

# Growing fruit in the land of the Bible

*AHR's Adam Goldwater conducted the interview.*

Australian Stonefruit Grower spoke to **Jon Nathan**, an Israeli farmer making a living on the politically fraught and unstable Golan Heights in the north-eastern part of Israel that's on the country's border with Lebanon, Jordan and war-torn Syria.



As if the political-military situation wasn't a problem enough, Mr Nathan faces all the other issues of a grower of cold-climate fruit in what is essentially a subtropical country in the Middle East.

However, some of the Golan reaches up to 2800m above sea level and although Jon's orchards and farm are in 320–350m height range, the climate is substantially cooler than elsewhere in Israel, and that is what makes Golan so suitable for growing stonefruit.

During most of the growing season there is no rain.

The winter starts in November and extends to March, as per the northern hemisphere. Frosts are rare but temperatures have been known get below 5°C.

During spring, local farmers may occasionally suffer from hail storms with their attendant potential to damage fruit and affect revenue. To deal with it, some farmers use netting, while insurance is also available – both adding to the costs of doing business. May–June bring unsettled weather and can create another hazard to fruit growers, namely the sand-filled windstorms called the Khamsin, with dry air and day temperatures that can top 35°C.

The farms on the Golan can range up to 50ha and can be any of the following: the kibbutz – a collective farm; the moshav – a type of cooperative agricultural community; and a bigger version of the moshav, a whole township: the so-called moshav shitufi, are of course much bigger than individual holdings.

Some smaller family farm units diversify and thus include grazing livestock for meat and dairy, plus poultry runs. But many growers go in for intensive farming, focusing on fruit exclusively.

The rainfall in the southern Golan averages 350–400mm and even up to 500–600mm in the north. Like in the rest of Israel, irrigation is used extensively, Israel being a world-leader in irrigation techniques such as drip irrigation.

“Irrigation water comes from a network of dams

“  
During most of the  
growing season there is  
no rain. The winter starts  
in November and extends  
to March ”

that collect the run-off from the surrounding hills,” Jon explained.

“The reservoirs are supplemented by bore water.

“Certain areas are also supplemented by water pumped from the Sea of Galilee because in the last few years the winter rainfall has not been enough to fill the dams.

“The irrigation is made more efficient using drip irrigation. Control of the irrigation is by advanced computerised controllers produced by several companies here in Israel.

Some of these can even be controlled from smart phones.”

We asked what are the common varieties of stonefruit grown in Israel, and who breeds them.

“Apricots: Ra'anana (a locally created cultivar) and Canino; plums: Black Gem, Sungold, Black Diamond, Black Amber, Friar, New Yorker, Santa Rosa, Nubiana; Peaches: Tasty Zee, September Snow, Summer Snow, 1881, Hermosa; nectarines: 15RC338, Late Fair, Fairlane, Flamkist, Fantasia, Flavour Top, Big Top, Queen Giant, 5-15, Arctic Pride, Arctic Star,” Jon said.

“Most of the varieties have been introduced from the US or South Africa but some have been propagated by local growers.”

For all fruitgrowers pests on the wing are a common worry. So is fruit fly an issue for Israeli orchardists and therefore the marketing, and if so, how is it managed?

“Of course, fruit fly is an issue,” Jon said. “Nobody wants to buy infested fruit! The requirements of the small export market have had some effect on the treatment for the control of fruit fly.

“Here, the relevant pest is the Mediterranean fruit fly.

“For many years, regular prophylactic spraying (in situ) was supplemented by aerial spraying with Malathion (Maldison). After a number of years the number of treatments from the air increased and this system was becoming more ineffective.



With mid-summer temperatures that often top 35°C, covering harvested fruit and delivering it promptly to the packhouse is essential.



Jon Nathan in his orchard.

“Some six years ago, a regional S.I.T. project was started with the support of the Israeli Ministry of Agriculture. This also involved the use of traps in the orchard (Seratrap) and the monitoring of the fruit-fly population, and the dispersion of sterilised male fruit flies grown by Bio Fly – a division of BioBee Biological Systems. (The Israel-based BioBee Biological Systems is one of the leading international companies in the field of biologically integrated pest management, natural pollination, and Medfly control – ed.)

“The use of chemicals specifically for fruit fly by ground spraying was reduced, and more integrated spraying, use of sprays for other pests also effective against fruit fly was introduced.

“There is weekly monitoring of the detection traps from the start of the season until at least a month after the last of the fruit is picked, to check for any infestation.

“Any infested fruit will be discarded at picking or at packing.”

What are the major markets for Israeli stone fruit?

“Most fruit is sold domestically through the wholesale markets or to the supermarket chains,” Jon said.

“There is a small amount of fruit that is exported, mainly to Europe, particularly early and late in the campaign. Due to the mild climate, the harvest season

lasts longer, starting in mid-April and coming to an end in December.”

Restrictions on chemical use must be a major issue for supplying European markets, so which chemicals are allowed or, conversely, banned for use on fruit for European markets?

“Restrictions on chemicals for the European market is on a list published for the growers by the Israeli Ministry of Agriculture,” Jon said.

“The most significant chemicals are the organophosphates, which are also being phased out in the local market. This means that dealing with many pests is becoming more difficult.

“There is more emphasis being placed on integrated pest control, taking into account natural enemies and making an effort not to kill them off.”

Where does labour come from?

“When units were small, ones that could be described as family units, and still reasonably profitable, there was more emphasis on using own labour,” Jon said.

“As units have grown there is an increased need for more and more workers. Most farms need permanent workers and a lot of positions are filled by foreign workers, mostly from Thailand, the number being controlled by the Ministries of Agriculture and Immigration, each grower



## Feature

being allocated visas according to size and type of farm. Also, both permanent and seasonal labour comes from Arab and Druze villages, about 90 minutes' drive from the Golan farms."

What are the major costs of production? Jon Nathan is definitive about this.

"Water and labour," he said.

"Labour is in pruning, thinning and of course, picking. Fruit size is very important so there is large emphasis on thinning, done manually where no mechanical or chemical options are available."

Would private ownership be the most common orchard ownership? And how does orchard ownership work on a moshav? Are there many kibbutzim (plural of kibbutz) growing stone fruit?

"In the moshav sector the orchards are generally privately owned the land being part of the allocation to the settlement by the Israel Land authority," Jon explained. "There are also kibbutzim growing stonefruit."

What is the packhouse situation for you?

*"Due to the mild climate, the harvest season lasts longer, starting in mid-April and coming to an end in December."*

"I work with an outside packhouse located in the Hula Valley, about an hour's truck drive from the orchard," Jon said. "There are a number of other growers from my moshav who also work with this packing house. However, on my moshav there are also a number of growers who have their own packing house and marketing structure. They grow large areas, and they are

self-sufficient.

"For smaller sized units, like mine, the structure of the packing house we work with is suitable for our needs, and provides an excellent marketing solution. There are instances where the packing house buys the whole of the crop from the farmers in other areas but this is not the case with us.

"The packing house packs a volume of about 15,000t p.a. and altogether markets a total of 25,000t, some of which – plums for example – is picked and packed into trays in the orchard and also fruit is sold in bins. They pack and market stonefruit, pipfruit, avocado and pomegranates plus a small amount of citrus fruit. There are between 80 to 100 growers, some of them from kibbutzim working with the packing shed.

"The packing shed representatives maintain close contact with the growers during the growing and picking season in order for both sides to achieve maximum results."

How does the pack house pay you? Do they take ownership of the fruit on arrival in the packhouse? Do they pay for quality such as size and cosmetic appearance?

"When the fruit arrives at the packing house it is initially documented, and registered and put into cool store," Jon said.

"Each bin has a barcode label with the grower's name, with the fruit and variety printed on it. It is then dealt with according to marketing strategy and orders for fruit in the marketing department.

"In my case, fruit is sorted, graded and packed and sold on my behalf.

"Good colouring pays more and blemished fruit, less. The difference in price between sizes can also be quite significant.



Labour for pruning, thinning and harvesting comes from Arab and Druze villages, about 90 minutes' drive from the Golan farms, as well as foreign workers mostly from Thailand.

# Blue-light disco for fruit flies

**Jennifer Ekman** explores some grisly ideas on how to lead pests into a fun place with flashing lights, where they will meet with a sticky end.

**F**ruit flies rely on their eyes to find food, mates and hosts in which to lay their eggs. They search for visual cues, including colour and shape, and have been demonstrated to be either attracted to, or repelled by, certain colours.

Attract-and-kill devices such as “Ladd” and “Fruition” traps effectively use reflected light and aroma to lure flies to a sticky death. In the case of the Fruition trap, its cobalt blue colour is believed to resemble the waxy, ultraviolet-light-reflecting bloom on the surface of rainforest fruits – the ancestral host of the Qfly.

But what about light itself? Many insects are attracted to artificial light sources, especially nocturnal fliers such as moths and beetles. Lights that emit large amounts of UV radiation are generally the most attractive. So, for example, “Bugzappers” use UV light to attract insects, then electrocute them.

UV lights work because insects see using a wider range of wavelengths of light than us humans. Most insects have compound eyes with peaks in sensitivity in UV, blue and green wavelengths – whereas humans see in blue, green and red. Bees, for example, use UV light reflectance to find specific flower species. Some mono-colour flowers may

look uninteresting to us, but have bright patterns, targets or ‘landing strips’ when seen using UV wavelengths<sup>1</sup>.

Manipulating UV light can help to manage some insect populations. Pests such as thrips, whiteflies and aphids use UV light to find hosts, and are attracted to high UV areas. Covering greenhouses with UV absorbing materials can reduce the number of thrips and aphids entering the crop<sup>2</sup>, particularly if they block wavelengths below 380nm<sup>3</sup>.

Other research has tested using green or yellow LED lighting in orchards to suppress the activity of heliothis moths. When the moths encounter light above a certain brightness their eyes lose their night adaptation. This means their normal nocturnal behaviours – flying, mating and eating – are significantly reduced<sup>5</sup>. LED lights are energy-efficient and inexpensive to buy, so could allow such methods to be used in orchards.

Traps using UV light can monitor what species are present as well as provide information on the relative density of different populations<sup>4</sup>. UV light traps have also been used as mass trapping devices to control pests, although with more variable results. One successful example is the management of rice stem borers in Japan



# Research

using blue fluorescent light traps<sup>5</sup>. Moths have proven more difficult to control, despite the large numbers found in light traps<sup>6</sup>.

UV light is not only attractive to nocturnal insects, although in broad daylight the effects are less dramatic.

Macquarie University, together with Applied Horticultural Research, recently conducted a series of tests in the laboratory, large outdoor field cages, and finally in a chilli crop, looking into exactly this question. The work was funded by Horticulture Innovation Australia using the vegetable R&D levy and funds from the Australian Government and - perhaps surprisingly - it's the first time such a study has been done.

The gazania, at left, is how we see the flower, whereas the image at right shows how it appears to an insect's eye.



Current monitoring systems for Qfly use traps baited with the parapheromone cue-lure. This has the disadvantage that it only attracts male flies. Moreover, if MAT is being used in the same orchard then trapping data is unreliable.

Tests with different species of moths have shown that UV light can be quite sex specific; it can attract mainly males, mainly females or the whole population<sup>7</sup>. In this case both male and female Qfly have been found to be equally attracted to UV light. Attraction was most pronounced around dusk and immediately afterwards, the usual time at which Qfly mates.

The Qflies were also attracted to green LED lights – but in this case during the day rather than at night. In contrast, the flies tended to avoid areas strongly illuminated with white light at all times.



**A prototype UV light trap for fruit flies, installed in chilli crop. Yellow sticky traps were added to check how many Qfly visited the light.**

<sup>1</sup>Gonzalez-Varo JP, Ortiz-Sanchez JF, Vila M. 2016. Total bee dependence on one flower species despite available congeners of similar floral shape. PLoSone <http://dx.doi.org/10.1371/journal.pone.0163122>

<sup>2</sup>Nguyen THN et al. 2009. Manipulation of ultraviolet light affects immigration behavior of *Ceratothripoides claratris*. J. Econ. Entomol. 102:1559-1556.

<sup>3</sup>Costa HS, Robb KL, Wilen CA. 2002. Field trials measuring the effects of ultraviolet-absorbing greenhouse films on insect populations. J. Econ. Entomol. 95:113-120.

<sup>4</sup>Thomas CD. 1989. Limits and scope of light-trapping for studying moth population dynamics. NZ Entomol. 12:89-90.

<sup>5</sup>Shimoda M, Honda K. 2013. Insect reactions to light and its applications to pest management. Appl. Entomol. Zool. 48:413-421.

<sup>6</sup>Frank FD. 1988. Impact of outdoor lighting on moths: an assessment. J. Lepidopterists Soc. 42:63-93.

<sup>7</sup>Garris HW, Snyder JA. 2010. Sex-specific attraction of moth species to ultraviolet light traps. Southeastern Naturalist. 9:427-434.

# Research

To investigate this further, a series of trials were conducted using large potted plants inside a net house. Trees at either end were treated with insecticide, with netting suspended underneath to catch dead flies. The trees were illuminated with UV light or left unlit, with treatments reversed for each replication of the trial.

Significantly more Qflies landed on plants that were illuminated with UV light than those that remained unlit. However, this

“So, it is clear that Qfly is attracted to UV light. Unfortunately, that attraction is not very strong. One option would be to combine UV light with other attractants.”

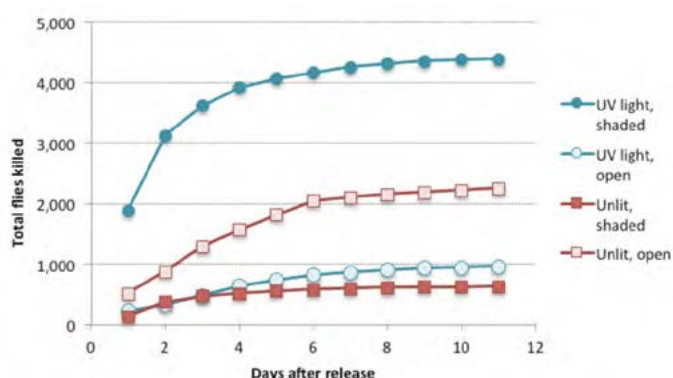
only occurred when the plants were placed in a shaded area. When a plant in an open area was illuminated with UV light, the light had little effect, or even repelled the flies.

The next step was to construct a prototype UV light trap. This included UV light strips, a solar panel, timer and hood to shade the light source. The trap was placed in

a field of chillies and programmed to turn on for two hours at dusk. This site was chosen because it was being used for another trial and large numbers of fruit flies were being released. Yellow sticky traps were used to compare the number of flies coming to the UV light with those in the general cropping area.

Females outnumbered males 4:1 on the yellow sticky traps, regardless of UV exposure. In total 828 female and 134 male flies were caught next to the UV light, compared to 343 female and 82 male flies in the field area.

So, it is clear that Qfly is attracted to UV light. Unfortunately, that attraction is not very strong. One option would be to combine UV light with other attractants – such as colour, or food-based lures. A trap based on such a combination could provide an alternative way to monitor Qfly populations.



**Total Qflies killed on insecticide treated trees that were illuminated with UV lights or not, and placed in either an open or shaded area. (6 replications)**



**Clear pieces of sticky film that were hung in front of a UV light or elsewhere inside a field cage. There are clearly more flies on the film that was suspended in front of the UV light.**



# Rain ruins Riverland apricot season

By *Brittany Evins*

Photo: Bill Spurlock,  
Sunny Slope Orchard, Ca.



Excessive rain last year has led to one of the worst seasons in memory for apricot growers in South Australia's Riverland. The rain had damaged the crops, splitting their skin and darkening them, which cut around \$4 off the price per kilogram.

**T**he chair of the South Australian Dried Tree Fruits Association, Kris Werner, discussed the effects the weather had on the crops saying it was “Probably the worst (season) I’ve had as long as I’ve been in the industry. It just seems to want to rain every week,” he said.

“At this point it’s probably a 50 per cent loss of income. Anyone who’s doing dried fruit for instance is certainly suffering,” he said.

The Riverland experienced around 299mm of rain last year which was well above average.

Renmark fruit grower Phillip Simms has spent more than 50 years in the dried apricot industry and said although fruit sizes had been excellent, he had never experienced such a poor season. With the season’s falling profits some farmers are even having to turn away workers, as they cannot afford them.

“That’s sad in a way because it’s the sort of job where a lot of local children, school age, have been able to come and apricot cut, but it’s not there this year.”

“Apricot season has been, crop-wise, disastrous,” he said.

Stonefruit such as apricots are most susceptible to rain damage when they are close to harvest. The high sugar content inside the fruit draws moisture through the skin and swells the flesh. Unfortunately, the skin does not expand at the same rate and simply splits.

At times, cherry growers have hired helicopters to blow poorly timed rain off their trees, like giant air-blade hand-dryers. Hideously expensive, but a surprisingly effective solution to fruit splitting.

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*This story first appeared on the [abc.net.au](http://abc.net.au) news website*

# Managing fruit fly



One of the problems with fruit flies is that they are highly polyphagous. That means, they attack pretty well any fruit they can manage to stick their ovipositor into.

**F**ruit flies are not just a pest for stonefruit growers, but also affect growers of apples, mangos, strawberries, passionfruit, citrus and so the list goes on. Hosts even include fruiting vegetables such as capsicums, chillies and cucumbers.

Horticulture Innovation Australia recently funded two projects into new in-field solutions to control fruit fly, using the vegetable R&D levy and contributions from the Australian Government. Some of the options tested included insecticides, perimeter baiting, light traps and netting. So, for example, it was shown that applying bait at different heights influences its effectiveness, while nets can provide both a visual and physical barrier to flies entering a crop.

The findings are summarised in a 32-page booklet entitled "Fruit fly management for vegetable growers". Produced by Applied Horticultural Research (AHR) as part of the project, the booklet describes the options available to producers of fruiting vegetables, and some of the pros and cons of each strategy.

Of course, there are obvious differences between a peach orchard and a capsicum crop. However, information on different species, lifecycle, fly behaviour, monitoring and telling the difference between a fruit fly maggot and a vinegar fly maggot is just as useful for stonefruit growers.

### Fruit Fly Management for Vegetable Growers



Horticulture  
Innovation  
Australia

### THE BOOKLET CAN BE DOWNLOADED FROM THE AHR WEBSITE AT

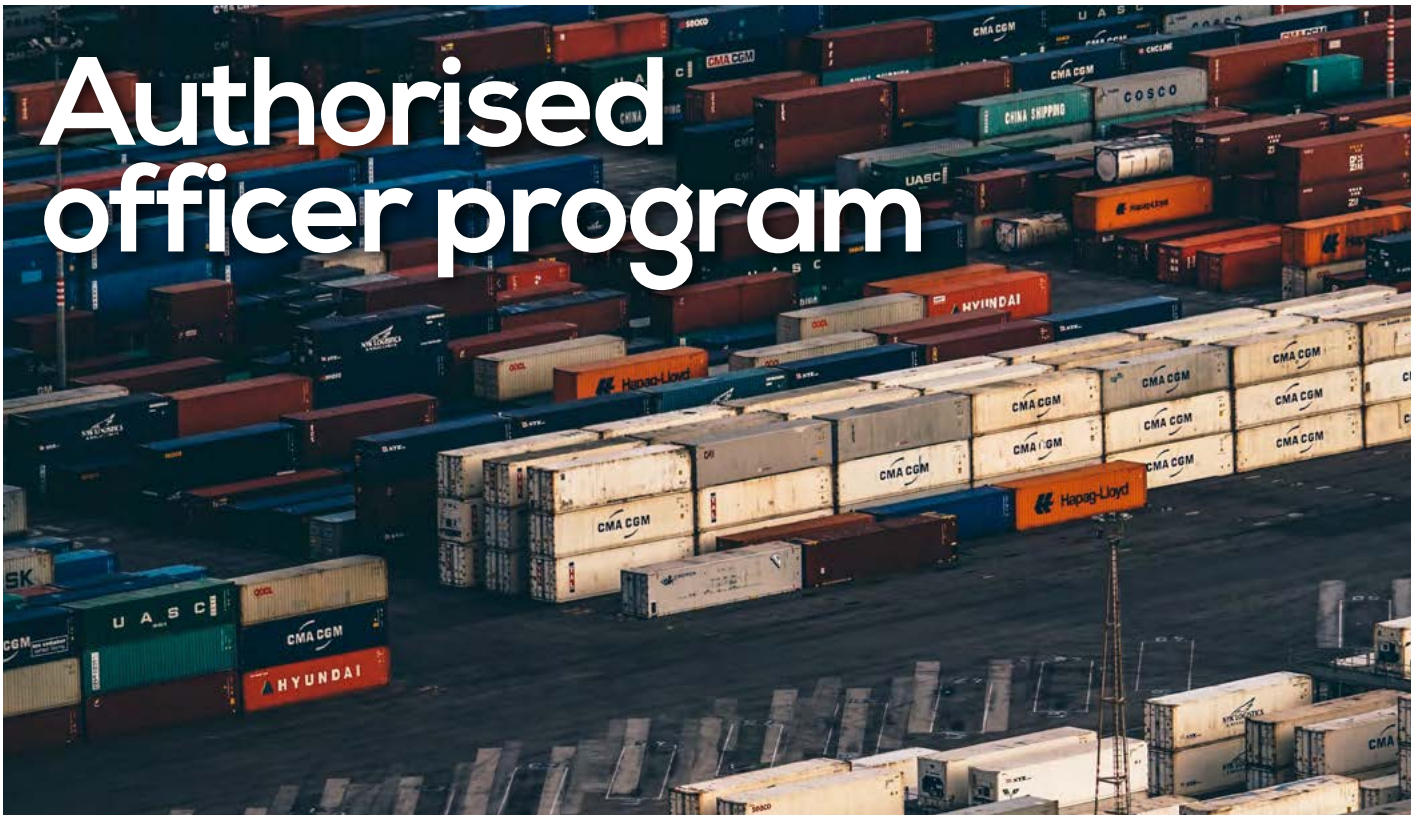
[ahr.com.au/pests-and-diseases/fruit-fly-management-for-vegetable-growers-new/](http://ahr.com.au/pests-and-diseases/fruit-fly-management-for-vegetable-growers-new/)

The key practices described in the guide are further demonstrated in a series of five short YouTube videos on controlling fruit fly in vegetables. These can also be viewed through the AHR website and cover topics including:

1. Targeted control.
2. Monitoring.
3. Food-based baits.
4. Male annihilation and female-biased traps.
5. Netting, repellents and field hygiene.

Copies of the booklet and videos will be available at Hort Connections 2017 in Adelaide, as well as at field days and other events.





## Package to assist small exporters

The Department of Agriculture and Water Resources (DAWR) has funding available to help exporters appoint their own Authorised Officer (AO) to facilitate exports – but only until June 30, this year.

This funding is available to cover initial training, assessment and appointment of up to 400 AO candidates across horticulture, increasing the number of AOs by more than a third. The AOs will be able to conduct up to five nominated job functions, including export inspections of fruit as well as phytosanitary treatments – in-transit cold treatment.

As DAWR now has a tier for small exporters, growers / packers who export less than 400t of fruit per year can apply to become a “registered establishment”. Having an AO to conduct inspections at the packhouse has clear advantages in production efficiency.

For registered establishments the cost is \$1,200 in the first year, then an annual fee of \$600.

### More information

More information is available at <http://www.agriculture.gov.au/export/controlled-goods/plants-plant-products/ian/2017/2017-08>.

Applications to become a registered establishment become available in June / July this year, when DAWR issues a call for exports to all phytosanitary-affected markets.

Orchard and packhouse registrations will be conducted through a new online portal. Training will be held in conjunction with pest and disease monitoring workshops, dates to be advised.



There is little doubt that the discovery of 1-methylcyclopropene (1-MCP) has been the most exciting thing to happen in postharvest technology in the last 50 years. Marketed as SmartFresh, 1-MCP has changed our understanding of fruit ripening. It has also provided a tool to extend the storage life of some fruit and vegetables by days, weeks or even months at low temperature.

**C**limacteric fruit, such as bananas, apples and (most) peaches, ripen in response to ethylene. Ethylene can be added to the storage atmosphere to make fruit ripen synchronously and faster, as is done with bananas. Ethylene is also generated naturally within the fruit itself.

Non-climacteric fruit include grapes, citrus, strawberries and cherries. These fruit ripen gradually while attached to the plant. Ethylene production is low to zero, remaining constant throughout development. These fruit need to be picked when they are fully ready to eat, as few further changes occur after harvest.

Ethylene does not just control ripening. It affects disease development, susceptibility to chilling injury, yellowing

and a number of storage disorders. For vegetable crops, and non-climacteric fruit, all of the effects of ethylene on quality are bad.

Enter 1-MCP. Molecules of 1-MCP bind irreversibly to the ethylene receptors within the fruit. This not only stops the fruit producing its own ethylene, but also makes it insensitive to ethylene in the air around it.

Eventually the fruit (or vegetable or flower for that matter) makes new ethylene receptors and normal processes resume. How quickly this occurs depends on the storage temperature and the product metabolism. For apples stored at 0°C this takes months, whereas a fast respiring fruit or flower at 20°C can regain ethylene sensitivity in days or even hours.



# Research

## Using 1-MCP

Apples respond particularly well to 1-MCP. Once the storage room is filled, encapsulated 1-MCP (SmartFresh) is mixed with water, releasing the gas. Only tiny amounts are required, in the order of 0.5 to 1.0  $\mu\text{L.L}^{-1}$  (0.5-1.0 ppm). Treatment generally takes 24 hours, after which 1-MCP is undetectable in the fruit.

Apples are ideal for this treatment because they are the best they can be right at harvest. We don't want apples to ripen further and soften; we like them crisp and crunchy. Treatment with 1-MCP means that they can be held in a type of suspended animation for months. As it happens, 1-MCP also protects apples from scald, a serious disorder that could previously only be prevented by treating with the chemical DPA (diphenylamine).

Application of 1-MCP is more problematic for products that we DO want to ripen and soften after harvest – such as stonefruit. The trouble is that the effects of 1-MCP wear off at different rates for individual fruits, resulting in mixed ripeness. An example is avocados. These respond well to 1-MCP, which both delays ripening and reduces chilling sensitivity. This allows lower temperature storage, thereby reducing rots during long distance export. However, the fruit do not ripen homogeneously, so trays may need to be re-sorted to remove both hard and over-soft fruit.

Also, timing of application is critical. 1-MCP is most effective when applied before fruit commence ripening. Once ripening has started it initiates a cascade of other processes within the fruit, so is pretty well impossible to stop. So, if 1-MCP is applied to mature fruit that have started to produce ethylene then the effects range from simply slowing ripening by a number of days to nothing at all.

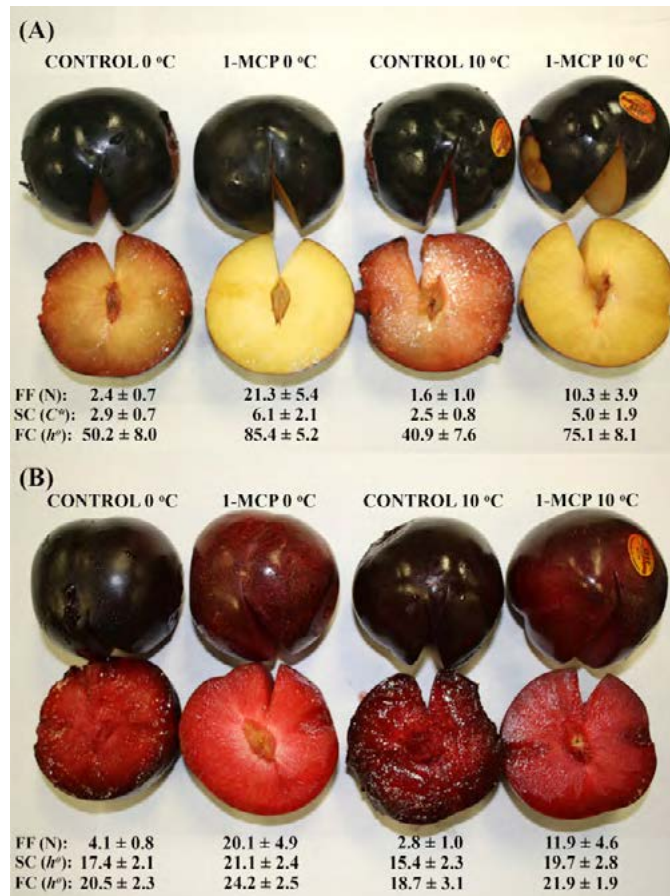
Stonefruit vary widely in how they ripen, and so how they respond to 1-MCP.

Enter 1-MCP. Molecules of 1-MCP bind irreversibly to the ethylene receptors within the fruit. This not only stops the fruit producing its own ethylene, but also makes it insensitive to ethylene in the air around it.

## Plums

Plums are unusual, in that they can be hard to define as either climacteric or non-climacteric. In many varieties ethylene production is suppressed, with minimal ripening after harvest. For example, Tegan Blue, Gulfruby and Beauty ripen with a distinct rise in ethylene production, whereas Angeleno, Shiro and Ruby Red are considered suppressed climacteric plums, with little to no ethylene increase.

Climacteric plum varieties are the most likely to benefit from 1-MCP treatment. For these fruit 1-MCP can delay softening and increase storage and shelf life. For example, a recent Australian trial with Dapple Dandy plums found a small, but significant improvement in



**Blackamber (A) and Red Lane (B) plums untreated or treated with 0.5 $\mu\text{L}$  1-MCP then stored at 0 or 10C for 10 days plus 6 extra days at 20C. From Minas et al, 2013.**

firmness in plums that were treated with SmartFresh then kept at 20°C. After two weeks most treated fruit were still edible, whereas untreated plums were completely soft.

However, it is really during long-term storage – such as for export – that 1-MCP treatment is most likely to prove worthwhile. A 2013 export trial of plums from Western Australia tested the effect of SmartFresh treatment on a number of varieties. The treatment reduced softening and skin colour changes (for some varieties) and maintained internal quality.

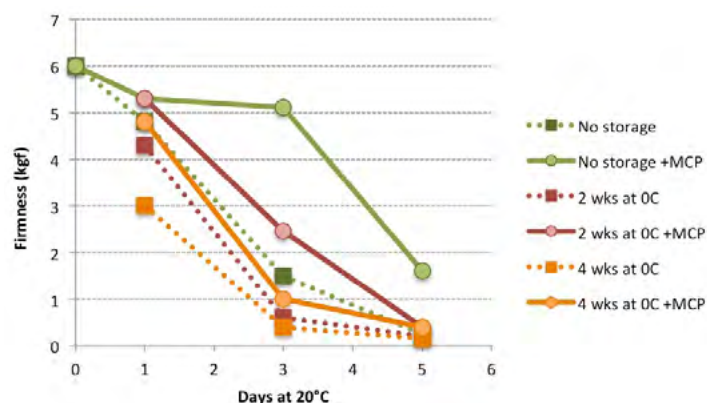
In this trial, SmartFresh had little effect on the firmness of Angeleno plums, which is unsurprising given that it is a “suppressed climacteric” type. However, the treatment virtually eliminated internal breakdown, which affected 20–30% of the untreated fruit. This result was likely due to 1-MCP treatment reducing cold damage.

While all plums are somewhat chilling sensitive, there is a strong connection between whether a plum goes through a strong climacteric during ripening and its sensitivity to chilling injury. Argentinian research has demonstrated that 1-MCP treatment not only delayed ripening after storage, but also greatly reduced chilling damage in strongly climacteric plums. In this trial Angeleno plums did not benefit from 1-MCP, as no chilling injury occurred<sup>1</sup>.

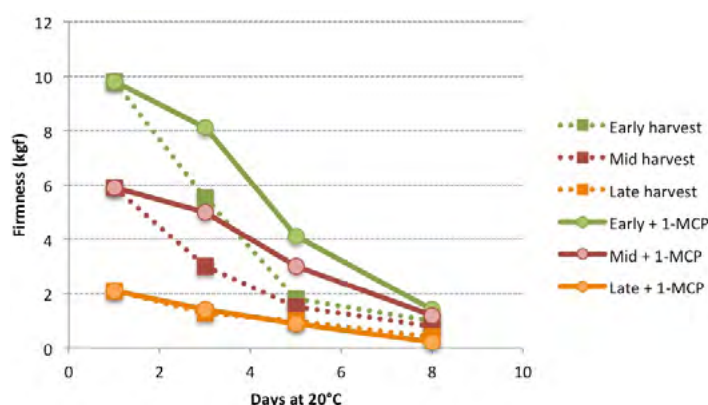
## Peaches and nectarines

Treating with 1-MCP can reduce ethylene production in climacteric peaches and nectarines (although not by as much as for plums) and slow the rate of softening during ripening. Effects tend to depend on concentration and exposure time, with effective concentrations ranging from 0.4 µL.L<sup>-1</sup> to 5 µL.L<sup>-1</sup> in different studies<sup>2</sup>.

However, responses of peaches to 1-MCP vary by cultivar and maturity at harvest and tend to be fairly transitory. Even in responsive varieties, the effects on peaches may be lost within 5 days at 20°C<sup>3</sup>.



**Effect of 1-MCP treatment on white nectarines cold stored for 0, 2 or 4 weeks then placed at 20°C. Data derived from Pantelidis and Vasilakakis, 2010.**



**Effect of 1-MCP treatment on firmness of peaches harvested at different stages of maturity then placed at 20°C. Data derived from Parker and Blankenship, 2012.**

Nectarines may be somewhat more responsive, although again effects vary by cultivar and tend to be short-lived. Research at Curtin University in WA found that Artic Pride nectarines treated with 1-MCP stayed slightly firmer (approx. 3kgf) than untreated fruit (approx. 2kgf) for 6 days at 20°C<sup>4</sup>.

Similar results have been reported for white fleshed Caldesi<sup>5</sup> and yellow-fleshed Fantasia<sup>6</sup> nectarines. Fruit that were treated with 1-MCP before 2 weeks storage at 0°C were firmer than untreated fruit on removal and remained

<sup>1</sup> Candan AP, Graell J, Larrigaudiere C. 2011. Postharvest quality and chilling injury of plums: benefits of 1-methylcyclopropene. Spanish J. Ag. Res. 9:554-564.

<sup>2</sup> Watkins CB. 2008. Overview of 1-methylcyclopropene trials and uses for edible horticultural crops. HortSci. 43:86-94.

<sup>3</sup> Parker ML, Blankenship SM. 2012. Postharvest response of peach and nectarine cultivars to 1-methylcyclopropene treatment. ActaHort. 962:549-556.

<sup>4</sup> Ullah S. et al. 2016. Postharvest application of 1-MCP and ethylene influences fruit softening and quality of Arctic Pride nectarines at ambient conditions. Aust. J. Crop Sci. 10:1257-1265.

<sup>5</sup> Pantelidis G and Vasilakakis M. 2010. Effect of 1-methylcyclopropene on quality attributes of Caldesi 2000 white-fleshed nectarine during cold storage. ActaHort. 884:605-610.

<sup>6</sup> DeEll JR, Murr DP, Ehsani-Moghaddam B. 2008. 1-methylcyclopropene treatment modifies postharvest behavior of Fantasia nectarines. Can. J. Plant Sci. 88:753-758.

<sup>7</sup> Lurie S and Weksler A. 2005. Effects of 1-methylcyclopropene on stone fruits. ActaHort. 682:85-90.

<sup>8</sup> Minas I et al. 2013. Postharvest handling of plums (Prunus salicina) at 10°C to save energy and preserve fruit quality using an innovative application system of 1-MCP. Postharvest Biol. Technol. 76:1-9.

firmer for 3 to 4 days at ambient temperatures. However, after 5 days shelf life there were no differences between treated and untreated fruit.

The effects of 1-MCP were even more short-lived when nectarines were stored 3 weeks or more, with apparent gains disappearing once the nectarines were transferred to 20°C.

In this study the Fantasia nectarines developed severe chilling damage after 4 weeks at 0°C. Treatment with 1-MCP reduced pitting and some internal symptoms, but did not prevent them.

As previously noted, if fruit have already started to ripen this will also reduce the impact of 1-MCP. An example of the effect of harvest maturity is shown below. This shows that peaches that are harvested early are more likely to respond to treatment, whereas softening fruit showed little response.

## Apricots

As with other stonefruit, the effect of 1-MCP on apricots varies considerably among different varieties. While some cultivars respond, others are relatively insensitive to 1-MCP. Although softening of stored fruit is reduced, ethylene production and respiration rates can be virtually unaffected by treatment. Moreover, one study found that 1-MCP increased internal browning from 3% to 40% of fruit<sup>7</sup>.

Apricots are treated with SmartFresh in Europe in order to extend marketable life. However, treatment protocols are specific to variety and need to be thoroughly tested before use.

## Can we apply 1-MCP in Australia?

In Australia, SmartFresh is registered for treatment of nectarines and plums. This season has seen increased use on plums, with fewer applications to nectarines. The recommended application is 0.5 µL.L<sup>-1</sup> for 24 hours at 0°C. Increasing the dose doesn't necessarily increase the effect; once the ethylene receptors are saturated, any more just goes to waste.

“  
In Australia, SmartFresh  
is registered for treatment  
of nectarines and plums.  
This season has seen  
increased use on plums,  
with fewer applications  
to nectarines.”

One of the issues with SmartFresh is the relatively long treatment time needed. Californian researchers<sup>8</sup> have found a way to treat plums faster, by adding 1-MCP during forced air cooling. In this case 6 hours treatment with moving air proved just as effective as 24 hours in still air. Moreover, the SmartFresh treatment allowed plums

to be stored at 10°C instead of 0°C, avoiding potential chilling injury and resulting in significant energy savings.

AgroFresh (owners of SmartFresh) have recently developed an “InBox” application system. Sachets containing SmartFresh are simply added during packing into lined cartons. Liquid 1-MCP dips are also on the horizon, along with other innovative delivery systems.

So why don't we treat more fruit? The answer probably lies in our strong emphasis on the domestic market. After all, why extend the storage life of one variety when others are coming onto the market? However, as we shift focus to flattening fruit supply, longer transport distances and export markets, this situation may well change.

## In Summary

- Treatment with 1-MCP can extend storage life and reduce chilling injury
- The effects of 1-MCP vary by cultivar, according to harvest maturity, and even between orchards
- 1-MCP works best on plums, but needs to be confirmed by variety
- Although the effects of 1-MCP on peaches and nectarines tend to be relatively transient, they may still be commercially significant in some circumstances
- 1-MCP is not currently registered on apricots.



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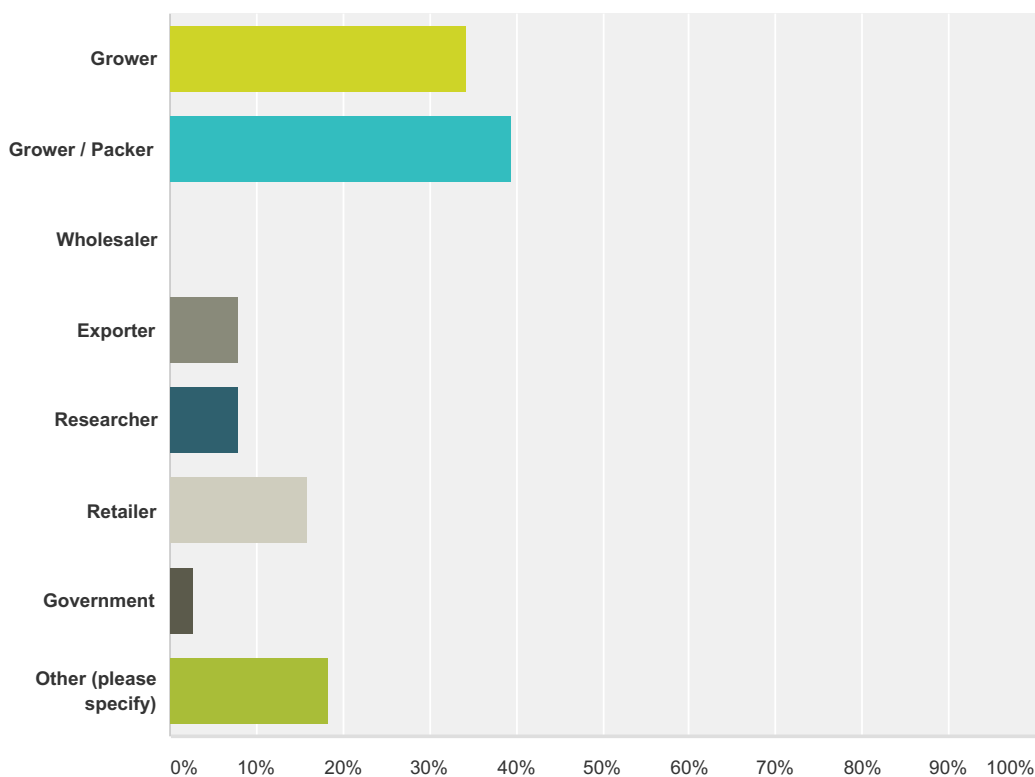
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## Q1 How are you involved with the Australian summerfruit industry? You may tick more than one box.

Answered: 38 Skipped: 0

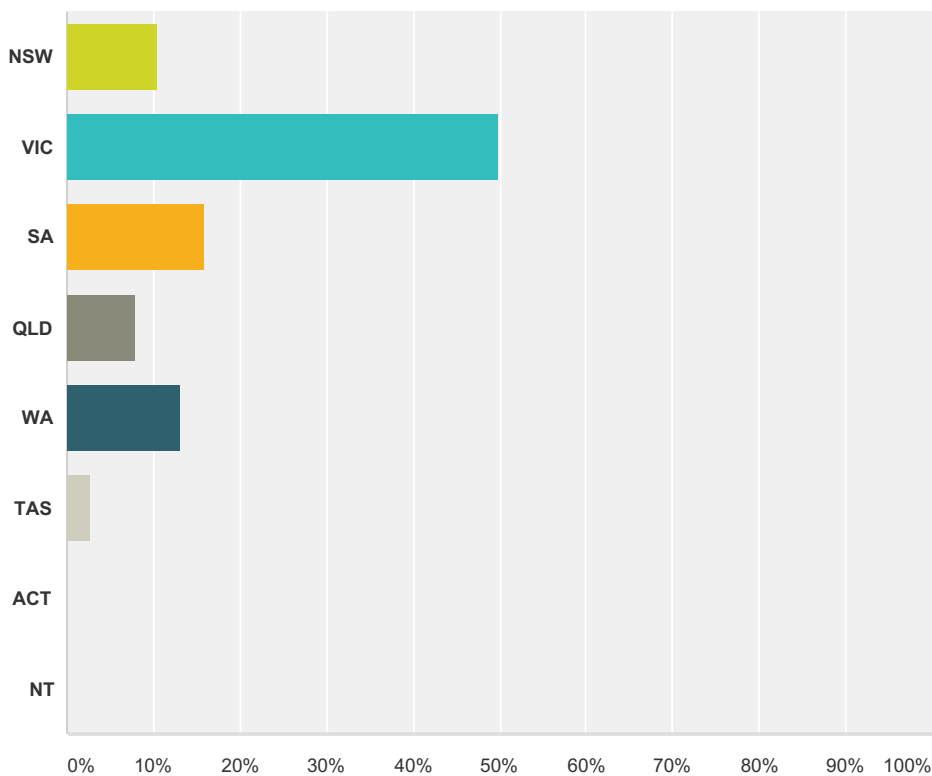


Answer Choices	Responses
Grower	34.21% 13
Grower / Packer	39.47% 15
Wholesaler	0.00% 0
Exporter	7.89% 3
Researcher	7.89% 3
Retailer	15.79% 6
Government	2.63% 1
Other (please specify)	18.42% 7
Total Respondents: 38	

#	Other (please specify)	Date
1	crop production advisor	4/20/2017 10:17 AM
2	Agronomist	4/19/2017 10:01 PM
3	Consultant	4/19/2017 8:46 PM
4	Marketing and promotion	4/19/2017 6:51 PM
5	Consultant	4/19/2017 5:16 PM
6	Agronomist	4/19/2017 4:04 PM
7	Quality Assurance	4/19/2017 3:12 PM

**Q2 Please select the state/territory where you live and/or conduct your operations. If you operate across more than one state, select more than one.**

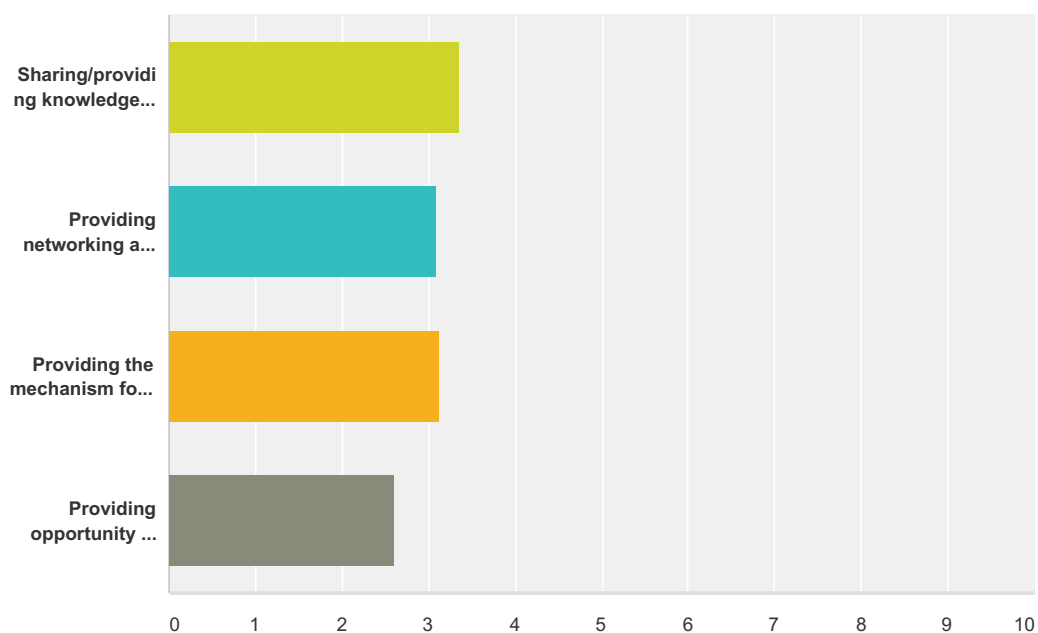
Answered: 38 Skipped: 0



Answer Choices	Responses	
NSW	10.53%	4
VIC	50.00%	19
SA	15.79%	6
QLD	7.89%	3
WA	13.16%	5
TAS	2.63%	1
ACT	0.00%	0
NT	0.00%	0
<b>Total</b>		<b>38</b>

### Q3 Please rate how effectively Summerfruit Australia is achieving the following:

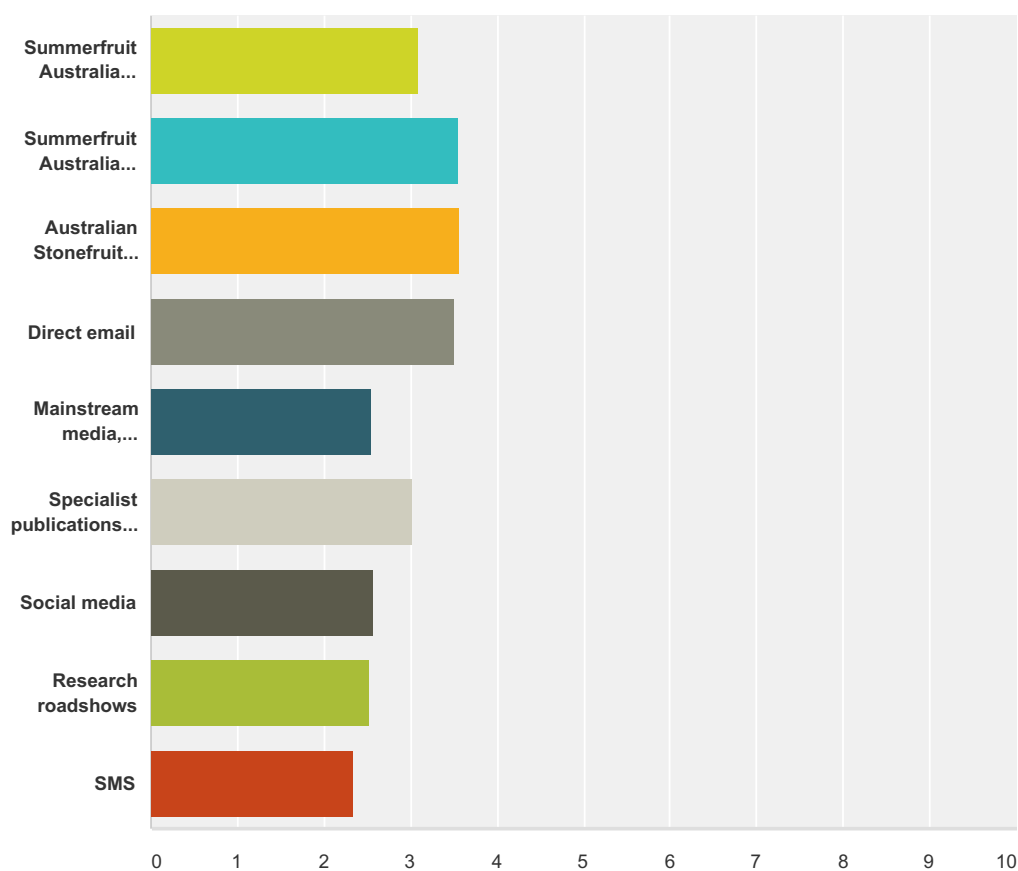
Answered: 35 Skipped: 3



	outstanding	very good	satisfactory	unsatisfactory	poor	Total	Weighted Average
Sharing/providing knowledge important to you in your job	0.00% 0	45.71% 16	48.57% 17	2.86% 1	2.86% 1	35	3.37
Providing networking and alliance options	2.86% 1	28.57% 10	51.43% 18	8.57% 3	8.57% 3	35	3.09
Providing the mechanism for continuous improvement	0.00% 0	34.29% 12	51.43% 18	8.57% 3	5.71% 2	35	3.14
Providing opportunity for self-education at farm walks, field days, etc.	2.94% 1	14.71% 5	32.35% 11	41.18% 14	8.82% 3	34	2.62

### Q4 Please rate the effectiveness of the following channels in communicating with you.

Answered: 37 Skipped: 1



	outstanding	very good	satisfactory	unsatisfactory	poor	Total	Weighted Average
Summerfruit Australia website	2.70% 1	27.03% 10	51.35% 19	13.51% 5	5.41% 2	37	3.08
Summerfruit Australia newsletter	5.41% 2	45.95% 17	45.95% 17	2.70% 1	0.00% 0	37	3.54
Australian Stonefruit Grower magazine	5.56% 2	50.00% 18	38.89% 14	5.56% 2	0.00% 0	36	3.56
Direct email	5.41% 2	45.95% 17	45.95% 17	0.00% 0	2.70% 1	37	3.51
Mainstream media, including television and regional newspapers	0.00% 0	5.71% 2	57.14% 20	22.86% 8	14.29% 5	35	2.54
Specialist publications such as Fresh Plaza, Good Fruit and Vegetables	0.00% 0	27.78% 10	52.78% 19	13.89% 5	5.56% 2	36	3.03
Social media	2.94% 1	11.76% 4	44.12% 15	20.59% 7	20.59% 7	34	2.56
Research roadshows	0.00% 0	14.71% 5	41.18% 14	26.47% 9	17.65% 6	34	2.53
SMS	0.00% 0	9.38% 3	40.63% 13	25.00% 8	25.00% 8	32	2.34



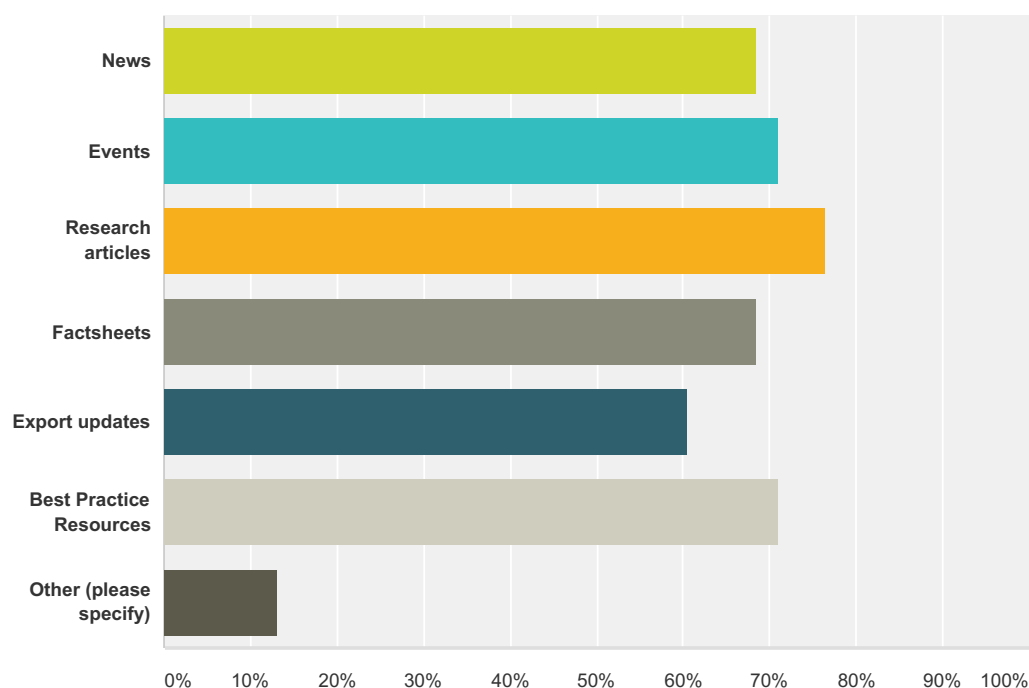
**Q5 Can you suggest other ways of creating effective communication channels, i.e. events, conferences, joint events with Apple and Pear Australia and/or other grower organisations, etc.? If not, leave blank.**

Answered: 19 Skipped: 19

#	Responses	Date
1	Combined field days and conferences other associations i.e. Cherry Growers Australia Also nut groups like Australian Almonds	4/26/2017 10:40 AM
2	An annual road show visiting all regions - provides an update of current issues, and gains grower feed back/comments	4/26/2017 8:49 AM
3	Study tours	4/23/2017 9:07 AM
4	keep all communication simple and direct. we do not have the time to view every email etc .	4/21/2017 12:50 PM
5	We growers in regions outside major production areas see little /no activity. Lack of resources the major issue. Joint events best option.	4/20/2017 2:24 PM
6	This is a hard one: stone fruit growers do not seem to turn up to conferences, even the most interesting ones....but they turn up to local events when there are any. There are too rare opportunities I think. We need more local events, run jointly with SummerFruits and non commercial people (I do not want to receive advise from people who have an interest in selling me their products). We need to get the researchers out there, out of theTatura institute or faraway labs, working on subjects decided by us growers, to come and report to farmers, in rural areas, twice per year. But first, researchers need to learn to stop reading their Power Point presentations and talk WITH us the growers. We need to have horticultural program managers to talk with us. For example, when is Dr Penny Measham going to meet us growers in Cobram and tell us what she is doing and listen to what us farmers are doing !	4/20/2017 5:58 AM
7	Conference. Some of these I marked as unsatisfactory because I wasn't sure if you actually did them.	4/19/2017 2:01 PM
8	More regional grower meetings and Stonefruit regional information networks. Similar to Citrus 'Citi Groups'	4/19/2017 12:46 PM
9	Joint events with APAL. A parallel project to the Future Orchards project (APAL) is an clear gap in the strategy.	4/19/2017 10:16 AM
10	A program for Summerfruit developed along the same lines as the Future Orchards program for apples	4/19/2017 8:53 AM
11	regionally specific events	4/19/2017 8:30 AM
12	Joint Event with Apple and Pear are a great idea. most areas have both crops and it would be win win if resources could be pooled, cuts down on the amount of time to be off farm at peaks also	4/19/2017 8:04 AM
13	All that is listed above.	4/19/2017 7:50 AM
14	Email similar to APAL Juicy News	4/19/2017 7:48 AM
15	No	4/19/2017 7:17 AM
16	You tube	4/19/2017 7:14 AM
17	Roadshows seem to work well in this area	4/19/2017 7:12 AM
18	Identify and work with key organisations that your levy payers (growers) value i.e. who do they buy their inputs from.	4/19/2017 6:57 AM
19	Instead of sending links via email how about having the actual story in the email to begin with?	4/19/2017 6:33 AM

## Q6 What type of information would you like to see on the Summerfruit Australia website? You may tick more than one box.

Answered: 38 Skipped: 0

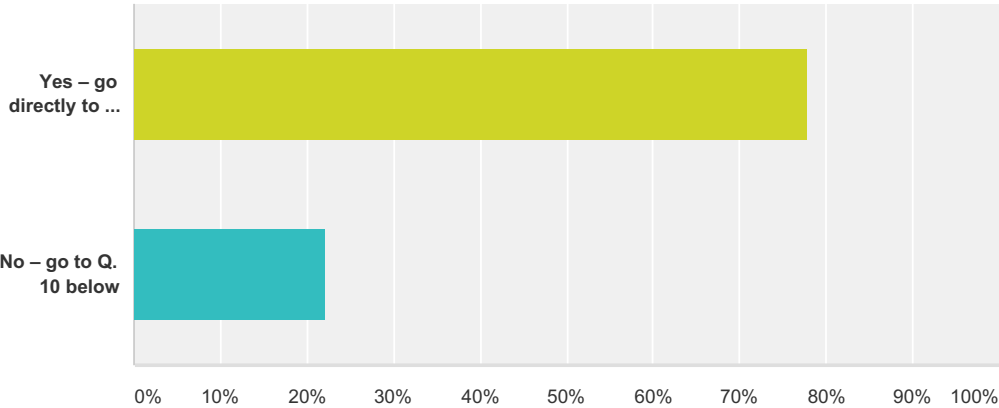


Answer Choices	Responses
News	68.42% 26
Events	71.05% 27
Research articles	76.32% 29
Factsheets	68.42% 26
Export updates	60.53% 23
Best Practice Resources	71.05% 27
Other (please specify)	13.16% 5
Total Respondents: 38	

#	Other (please specify)	Date
1	Id like to know what John Moore is seing during his many trips in Asia. What does he observe?	4/20/2017 1:58 PM
2	Local market updates	4/20/2017 1:07 PM
3	For me, websites are like a dusty archive that I go to in place of a library. Putting timely info like news and events without a driver does not work for me.	4/19/2017 6:16 PM
4	all of the above	4/19/2017 4:05 PM
5	All of the above	4/19/2017 3:12 PM

Q7 Do you read The Australian Stone Fruit Grower magazine?

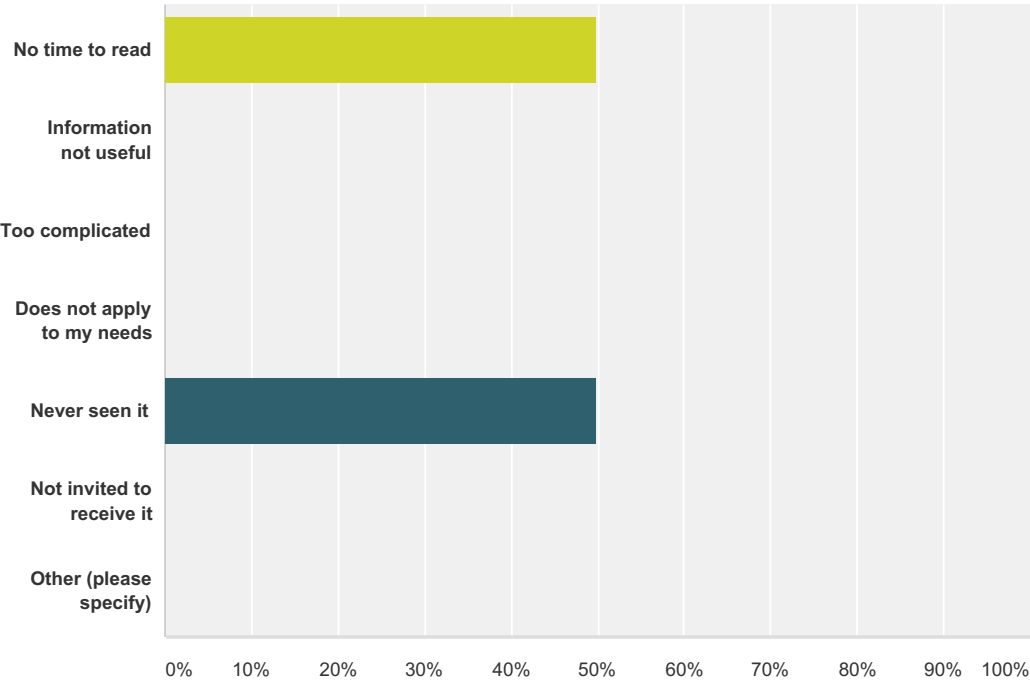
Answered: 36 Skipped: 2



Answer Choices	Responses	
Yes – go directly to Q. 11	77.78%	28
No – go to Q. 10 below	22.22%	8
Total		36

Q8 Please select a reason for not reading  
The Australian Stone Fruit  
Grower magazine.

Answered: 4 Skipped: 34



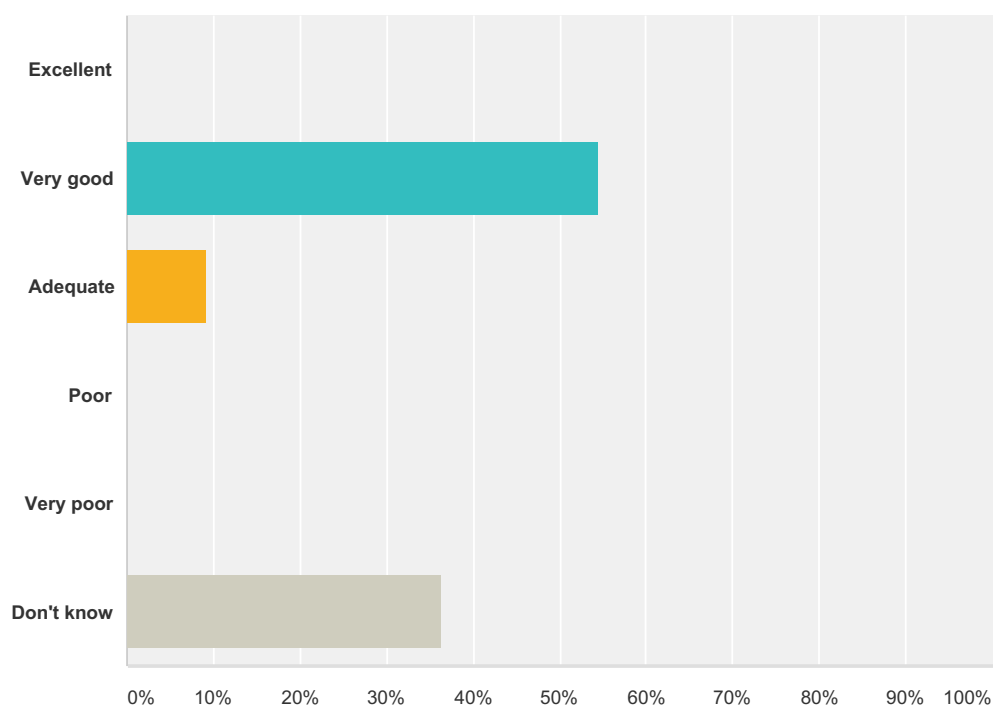
Answer Choices	Responses
No time to read	50.00%2
Information not useful	0.00%0
Too complicated	0.00%0
Does not apply to my needs	0.00%0
Never seen it	50.00%2
Not invited to receive it	0.00%0
Other (please specify)	0.00%0
Total	4

#	Other (please specify)	Date
	There are no responses.	



### Q9 How would you rate the new format of Australian Stone Fruit Grower edition starting in May 2016?

Answered: 11 Skipped: 27



Answer Choices	Responses	
Excellent	0.00%	0
Very good	54.55%	6
Adequate	9.09%	1
Poor	0.00%	0
Very poor	0.00%	0
Don't know	36.36%	4
<b>Total</b>		<b>11</b>

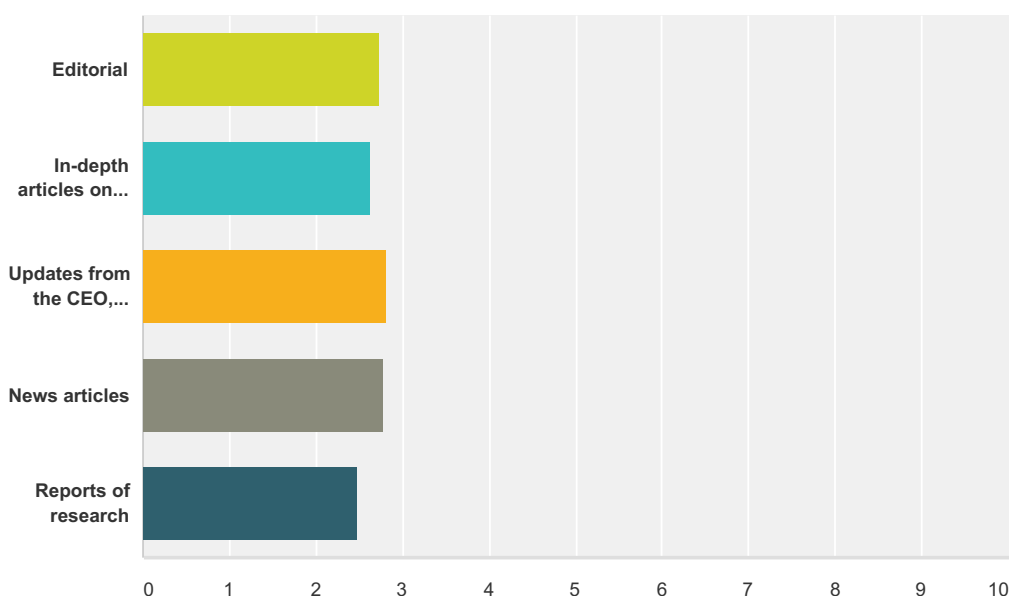
**Q10 If you have ticked “adequate”, “poor”, or “very poor” above, please explain briefly the issues you are having with the magazine:**

Answered: 1 Skipped: 37

#	Responses	Date
1	again you prove my pointyou have this section all wrong	4/21/2017 8:50 PM

### Q11 If you receive Summerfruit Australia email notices (Grower and Industry Updates), how useful do you find them?

Answered: 36 Skipped: 2



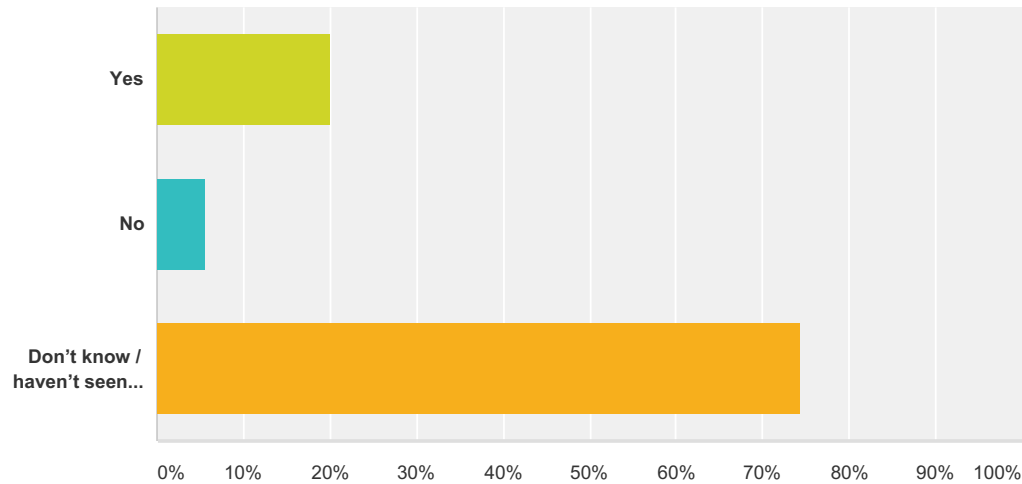
	Essential information	Very useful	Useful	Rarely useful	No use	Total	Weighted Average
Editorial	0.00% 0	31.43% 11	62.86% 22	5.71% 2	0.00% 0	35	2.74
In-depth articles on specific topics	2.86% 1	37.14% 13	54.29% 19	5.71% 2	0.00% 0	35	2.63
Updates from the CEO, chairman and president	2.78% 1	25.00% 9	61.11% 22	11.11% 4	0.00% 0	36	2.81
News articles	0.00% 0	30.56% 11	63.89% 23	2.78% 1	2.78% 1	36	2.78
Reports of research	14.29% 5	25.71% 9	57.14% 20	2.86% 1	0.00% 0	35	2.49

#	Are there any other sections you would like to see?	Date
1	Grants/funding opportunities	4/20/2017 1:58 PM



Q12 Do you find information videos for growers useful (such as, the DVD on stonefruit) and would you like to see more of them produced?

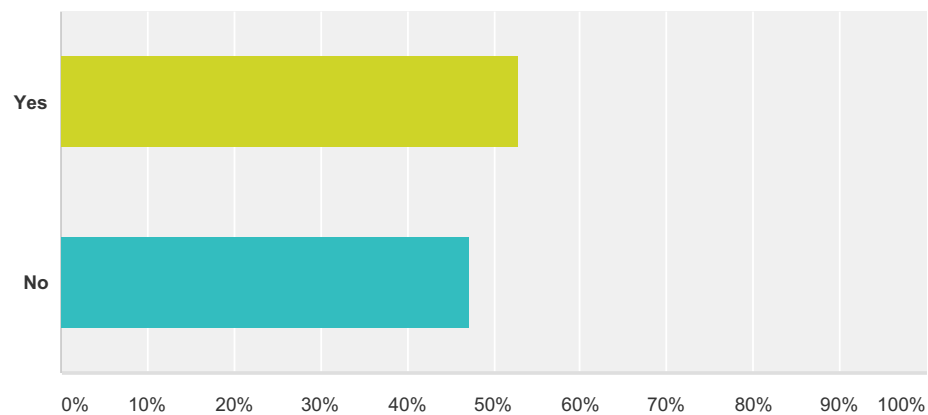
Answered: 35 Skipped: 3



Answer Choices	Responses
Yes	20.00%7
No	5.71%2
Don't know / haven't seen any	74.29%26
Total	35

Q13 Would you like to receive monthly updates by way of a supplement to the quarterly magazine?

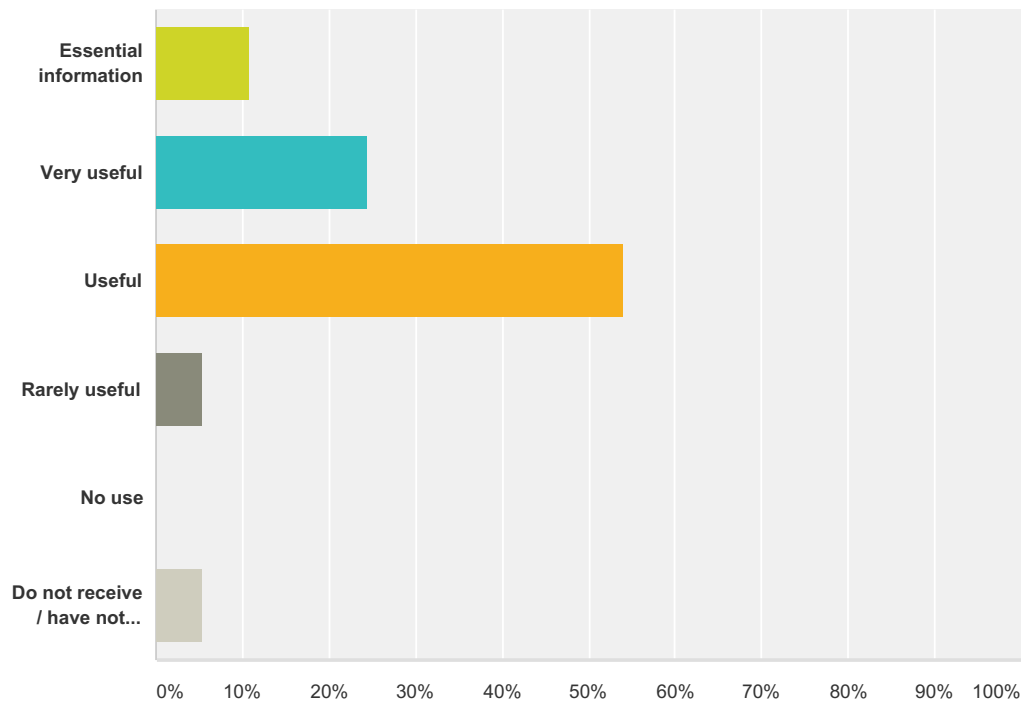
Answered: 36 Skipped: 2



Answer Choices	Responses	
Yes	52.78%	19
No	47.22%	17
Total		36

Q14 If you receive Summerfruit Australia email notices (Grower and Industry Updates), how useful do you find them?

Answered: 37 Skipped: 1

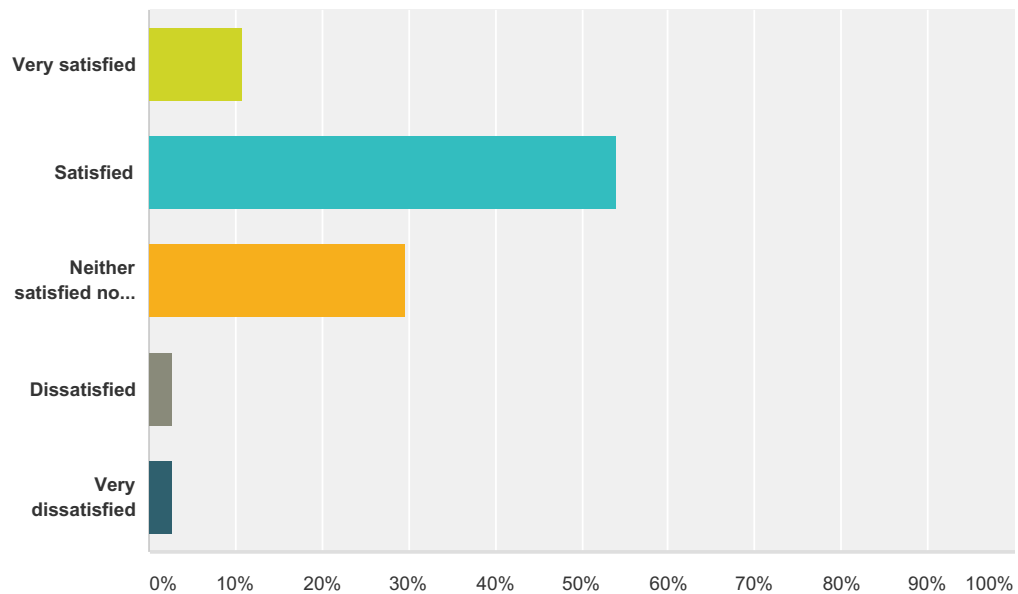


Answer Choices	Responses	
Essential information	10.81%	4
Very useful	24.32%	9
Useful	54.05%	20
Rarely useful	5.41%	2
No use	0.00%	0
Do not receive / have not received emails	5.41%	2
Total		37



### Q15 What is your satisfaction level with the summerfruit industry communications?

Answered: 37 Skipped: 1



Answer Choices	Responses	
Very satisfied	10.81%	4
Satisfied	54.05%	20
Neither satisfied nor unsatisfied	29.73%	11
Dissatisfied	2.70%	1
Very dissatisfied	2.70%	1
Total		37

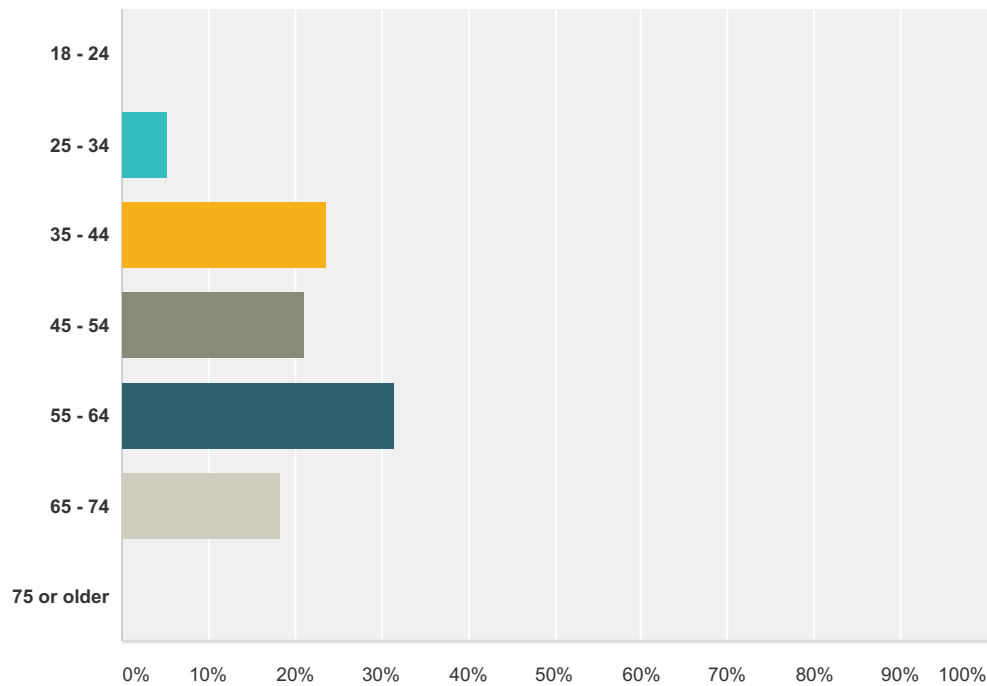
**Q16 If you answered “neither”,  
“dissatisfied” or “very dissatisfied” above,  
please briefly state how we could improve  
our communications with you.**

Answered: 8 Skipped: 30

#	Responses	Date
1	More technical information on achieving higher quality and best practice options	4/26/2017 6:40 PM
2	we have information over load . keep it simple and direct.	4/21/2017 8:50 PM
3	no resources available for the issue	4/20/2017 10:24 PM
4	Make regular and non commercial.	4/19/2017 10:01 PM
5	More direct emails with research papers and timely news	4/19/2017 9:05 PM
6	As a consultant the material is useful to keep me informed but in the end the material needs to be totally focussed to the growers	4/19/2017 8:46 PM
7	Improved communications generally means needing to commit more financial resources to be able to gather relevant information, the Summerfruit CEO could receive some level of funding through levies in order to facilitate providing additional content to the magazine aside from his current report which reflects his current job description and is China focused.	4/19/2017 4:53 PM
8	Maybe by being Australian based instead of eastern states based	4/19/2017 2:33 PM

Q17 What is your age group?

Answered: 38 Skipped: 0



Answer Choices	Responses
18 - 24	0.00%0
25 - 34	5.26%2
35 - 44	23.68%9
45 - 54	21.05%8
55 - 64	31.58%12
65 - 74	18.42%7
75 or older	0.00%0
Total	38

**Q18 General comments.**

Answered: 6 Skipped: 32

#	Responses	Date
1	Good luck.	4/19/2017 9:05 PM
2	AS above, websites, blogs and the like are not usefull without something to drive traffic to it. Something similar to the Tree Fruit emails that container a teaser and then a link to the article. Also gathers info on click throughs. Similarly, The Weekly Times has social media posts with links to their more complete articles.	4/19/2017 6:16 PM
3	There are huge amounts of research on Summerfruit conducted worldwide and a platform to link growers to research results, firstly to research done using Australian summerfruit levies, and then to research done worldwide that is relevant to the Australian industry would be a valuable tool and would communicate to growers the outcomes of latest research. The current magazine is delivered in electronic format and could provide a link to that platform or provide links to videos demonstrating new technologies, research reports etc	4/19/2017 4:53 PM
4	FEEL CONFIDENT THAT JOHN MOORE IS DOING A GOOD JOB..	4/19/2017 3:43 PM
5	This is a very poorly constructed survey, e.g. question 7 is misleading and would be confusing to some therefore some details may be neglected.	4/19/2017 3:12 PM
6	Weather is nice today	4/19/2017 2:33 PM



**Q19 If you would like to be contacted about  
Hort Innovation membership, please  
provide your details and a staff member will  
contact you.**

Answered: 1 Skipped: 37

#	Responses	Date
1	Geordie Wright geordie.wright@ausqual.com.au	4/19/2017 3:12 PM