



# TALKING AVOCADOS



smash an avo



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# Avocados Australia Limited

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**We all make mistakes.** If we make an error, please let us know so a correction can be made in the next issue.



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**Cover:** The exciting new 'Smash an Avo' campaign.

# Chairman's Perspective

This is indeed going to be another exciting year for our Australian avocado industry. As you are reading this, our latest marketing campaign has begun.

This campaign will help further promote the versatility and health benefits of our fruit. The 'Avocados make everything better – Smash an Avo' theme and all the associated activities will help build confidence around everything from storage and ripening to how to make best use of the avocado across a variety of meals.

For us in the industry, as growers, as pickers, as packers, as ripeners, as wholesalers we have one job as part of this campaign: to make sure our consumers always, always get the very best avocado we can provide.

Avocados are certainly in popular culture, think Waitrose's avocado-shaped Easter eggs in the UK (that sold out!) or the new avocado marriage proposal trend, but the only way we're going to keep having them repeatedly ending up in shopping baskets is quality.

While they are far from the normal reaction, some comments on the Australian Avocados Facebook page should be taken as a cautionary tale by industry, especially at times when the reality of supply and demand increases prices for our fruit. Some of the comments on quality have included:

- "I hate when they are dodgy inside but look OK on the outside, been to dear anyway!"
- "Too dear at the moment when you cut them bad inside"
- "Expensive and have to be eaten the first day you buy them otherwise they turn to S\*#T"
- "Not good when they cost a fortune and you cut into them and they're brown"
- "Wish I could work out if they are brown inside before I buy them. So tired of buying \$3 avocados that can't be eaten."
- "Get them back under 3 bucks and I might dance a little. Under \$2 I'll dance everywhere".



Please keep in mind the vast majority of the comments received on the Australian Avocados Facebook page are extremely positive; it's up to industry to ensure this trend continues. I don't know about you, but I really prefer reading comments from happy avo lovers.

I encourage everyone to keep up to date with the latest in best practice via the BPR on our website ([avocado.org.au](http://avocado.org.au)), or at one of the upcoming regional meetings (more in John Tyas' column on those), or at any of the variety of extension events we're hoping to bring you later in 2018.

Avo good one!

*Jim Kochi*

*Jim Kochi, Chairman, Avocados Australia Limited*

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# CEO's Report



## Regional meetings have started

The possibility of avocado imports, the progression on exports and supply chain improvements have all been hot topics for the avocado industry this year.

Avocados Australia, Applied Horticultural Research and various researchers have a schedule of regional meetings to help update industry on these topics and more.

The first events have already been held (Crows Nest and Coolumb in Queensland and Bunbury in WA). The remaining dates are:

- 21 May – Tristate – Renmark SA
- 31 May – North Queensland – Mareeba Q
- 5 June – Central New South Wales – Stuarts Point NSW
- 7 June – Central Queensland – Childers Q

You can find all the details, including full agendas at [avocado.org.au/events/](http://avocado.org.au/events/).

Attendees will receive free copies of the *Supply Chain Best Practice Guide*, *Fruit Quality Problem Solver* and Checklists and Ripeness guide, developed by AHR.

These are just the first of our 2018 events. Avocados Australia

has worked with various others, including the Queensland Department of Agriculture and Fisheries, to submit project proposals to Hort Innovation for a range of new extension activities from the end of this year.

In the meantime, these regional meetings are your chance to hear from us, researchers, workplace health and safety experts and various others on matters of importance to industry.

## R&D priorities

This year's survey of avocado growers in relation to their on-farm research and development priorities has reaffirmed the outcomes of the initial 2017 R&D Forum, held in Brisbane by Hort Innovation and Avocados Australia.

In each of the six main categories (genetics and propagation, disease, pests, crop production, precision ag, and fruit handling) respondents indicated the identified priorities as all being of importance for future research and development.

The survey respondents' top 10 identified priorities, based on those who deemed them to be "very important" or "important" across the six categories are:

- Disease – improved plant and root disease management for established orchards
- Crop Production – research to improve fruit set and fruit retention
- Crop Production – crop nutrition
- Precision Ag – canopy management (focusing on decision support tools)
- Fruit Handling – monitoring and measuring of practices throughout the supply chain
- Pests – regionally tailored programs to address priority pests
- Crop Production – irrigation
- Disease – improved plant and root disease management for new plantings / orchards
- Pests – R&D of new knowledge and research, for example monitoring tools, new management controls
- Disease – improved fruit management practices within orchards.

In addition, a majority of those who provided additional comments identified specific topics within the broader priorities. Some respondents took the time to provide quite detailed suggestions, demonstrating how much value we as an industry place on research and development.

The full results of the survey, including all of the additional comments and details, have been provided to Hort Innovation

## Order your Kangaroo Labels

Avocados Australia manages the Kangaroo Label and a set of barcodes for use on Australian avocados.

Kangaroo Labels can be ordered through our registered Kangaroo Label suppliers listed below. Grower packers and packhouses need to apply for a Packhouse Registration Number (PRN) with Avocados Australia before an order can be placed.

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and the Strategic Investment Advisory Panel, for use in future R&D planning.

## New marketing campaign

After a few unwanted delays, the new avocado marketing campaign is now up and running with the new television commercial hitting the airways on 29 April. The campaign has been developed based on rigorous new consumer research (see pages 42-44) and involved a very competitive tender process to select the new creative agency. The strategy is very sound and has been strongly endorsed by industry leaders. I look forward to seeing how the various elements perform during the year – TV, digital and out-of-home in particular. Hort Innovation will provide more information about the new campaign in the next edition of *Talking Avocados*.

## Be alert, not alarmed

On the subject of R&D, I encourage everyone to read the summary of international research in this edition (pages 46-49). There are quite a few research papers this quarter from a number of countries stating ‘first reported incidence’ of various pests and diseases. This highlights the need for on-going vigilance around biosecurity in Australian avocado orchards. The cheapest way to deal with pest and disease incursions is to prevent them in the first place. This year, we are updating the Avocado Industry Biosecurity Plan to make sure our industry is doing all it can to prevent new incursions.

## New to Avocados Australia

Last edition, I introduced you to our new Export Coordinator Joy

Tang. This edition, we have another new face in Jayne Weedon. Jayne is our new Administration and Finance Manager, having replaced Maree Tyrrell. Jayne will be overseeing the administration and finance tasks as well as project support to the team. Prior to Avocados Australia, Jayne’s background includes 17 years’ experience in administration management in various settings, including both mining and software.



As many of you will already be aware, after 10 years with Avocados Australia, Maree has decided to pursue some new projects.

“Working with a leading peak industry body in horticulture has been an exciting period of my career,” Ms Tyrrell said. “It has been a pleasure to be involved in high level events including the World Avocado Congress and the Australian and New Zealand Avocado Growers’ Conferences, working with two CEOs and a range of staff and directors. I know the industry will continue to move from strength to strength.”

Maree played a huge role in all aspects of the organisation’s business and many of our successes. She has provided enormous assistance to me over the past five-and-a-half years and will be sorely missed. I wish her all the best in her future endeavours.

*John Tyas*

John Tyas, CEO, Avocados Australia Limited

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# Around Australia

## South Queensland Report

By Daryl Boardman,  
Avocados Australia Director



I hope everyone had a nice Easter break, if you were able to, and you are now getting close to the 2018 picking window in South Queensland.

It's also now a good time to look at your root levels and plan for your phytophthora control. Looking around most orchards in the region, the fruit size and development looks good.

The insect pressure has been quite high due to warm wet conditions and there is a feeling that current chemicals for fruit spotting bug control may not be working as well as we would all like to see. This is a pest that can cause quite a lot of downgrading if not controlled but without good chemistry to help us it's a difficult pest to control.

I hope many of you attended the Avocados Australia regional meeting at Crows Nest in early May, and that you got a lot out of the day. Avocados Australia is working toward a new national extension project, to help keep us all up-to-date on the latest research and management techniques. I hope to see many of you at these workshops and field days in future.

We will also have had a visit from our current Federal Minister for Agriculture, David Littleproud by the time you receive this magazine. The Member for Maranoa visited the Sunnyspot Packhouse and met with AAL board members and CEO John Tyas. This gave him a good understanding of our industry and how it is growing in volume around the country. We were also able to provide the Minister with an understanding of our differences with growing and other challenges we face. Read more on page 17 of this edition.

Hopefully by now you have seen the new media campaign which was launched on 29 April (more on page 12-16 of this edition). There will be TV adds, social media and other advertising which the industry hopes will keep avocados at top of mind for consumers and moving through the system.

It's now time to get the firewood cut and ready for winter; we have already seen some cool weather and snow in the southern states. And here's hoping for no bad frosts this year.



*Alvin the Avocado leant his star power to promoting the 2018 Shepard season. Alvin made various in-store appearances with the good folk of GreenSkin Avocados across Brisbane in March and April.*

## Central Queensland Report

By Eric Carney, Avocados Australia Director



Avocados from Central Queensland are 30% bigger than last year in terms of sizing, Avocados Australia Central Queensland Director Eric Carney told the *Queensland Country Life* in late April.

"Our growing season has been very good this year," he said. "We've had a lot more rain than previous years, so sizing is considerably up on last year.

"The overall crop is up; it's slightly bigger than last year, and a part of that's just due to the increased fruit size."



*Alvin the Avocado was a hit at the The Glennie School Fair and the My Local Feast Farmers Markets in Toowoomba, Queensland early in March socialising with the crew of Just Avos at the produce stand. We're told the avocados and other produce and seedlings on sale at the Glennie event were very popular with visitors (as was a certain green tights wearing legend).*

## Tristate Report

By Kym Thiel, Avocados Australia Director

As I write this short piece I look out the window here to see a dry and dusty landscape and I start thinking of the pouring rain in the far north of Queensland in March.



It highlights the extremes of our country as we have not had significant rain (above 5mm) in the Tristate since the beginning of January, whilst parts of far north Queensland have had more than 250mm in one day. Temperatures in early April have been well above average with daytime temps reaching 35-36 degrees, which has kept trees growing and flushing especially considering most are carrying well below average crops. Hence, fruit size is well up on last year, and an average year with fruit in some orchards already begin a count 20-23. I know!!!! – not what the market necessarily wants. Given there is still around six months till harvest most fruit will be on the larger size which may help to make up for some of the loss in crop due to factors we don't exactly know.

That is just one reason why the work being carried out by Harley Smith and his team from the CSIRO on alternate bearing and fruit abscission is so important. Unlike the previous season heat from the 2017/18 summer didn't drop fruit as there was only limited fruitlets on the tree after a poor fruit set and poor early fruit retention. Fruit quality does appear to be up

though with fruit looking cleaner in the orchard at this early stage. Many growers have helped this by making the most of the downtime after an early finish to harvest by pruning and removing deadwood from the orchard.

The SAAGA AGM will be combined with the Avocados Australia regional meeting to be held in Renmark on 21 May. This is a great chance for growers to come along and hear all the latest in information from your national peak body which has been very active over the past few months. There is a lot to hear so I encourage all growers to make an effort to come along. More details are on the website at [www.avocado.org.au/events/upcoming-events/](http://www.avocado.org.au/events/upcoming-events/).



*AHR's Dr Jenny Ekman (centre) with Jim Gibson and Kate Erbacher at the Crows Nest regional update in early May.*

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## Around Australia continued

### Western Australia Report

By Dudley Mitchell, Avocados Australia Director



Our West Australian Director Dudley Mitchell was overseas in April, having started his Nuffield Scholarship. He will study current trends in canopy management of avocado orchards and how cultural practices need to adapt to higher density orchards. You can read more here: <http://nuffield.com.au/dudley-mitchell/>. If you are inspired, applications are now open for the 2019 scholarships, details at <http://nuffield.com.au/>.

For all the latest industry updates, West Australian growers attended the 2018 Avocados Australia regional meeting in Bunbury on 15 May. On the day, growers heard from Avocados Australia CEO John Tyas on the latest with regard to industry changes, avocado imports and exports, and updates of various projects. Attendees will receive free copies of the *Supply Chain Best Practice Guide*, *Fruit Quality Problem Solver* and *Checklists and Ripeness guide*, developed by AHR.



While on a Nuffield Australia tour of Europe, West Australia's Dudley Mitchell had the chance to check out some imports from Peru, while at the Florence Mercato Centrale.



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## Sunshine Coast Report

By Robert Price, Avocados Australia Director

It's been a relatively wet summer in the Sunshine Coast area, not much flooding but more of a reliable rainfall with some dry periods that didn't put the trees in much stress. Humidity has been at levels that have been relatively easy to manage with strategic spraying and by all accounts the insect problems have been low with low populations of fruit spotting bug infestation. All in all, the season has been conducive to the orchards as the majority of trees are looking very healthy.

Word coming in from north of the Sunshine Coast regarding fruit quality is that the fruit are looking good and the quality is high. The crops are similar here and the dry matter is beginning to reach QA levels, so there may be some earlier starts for the local picking season.

The current Avocados Australia 2018 Regional Meetings are helping us continue to share industry-relevant information around the country. Apart from the valuable information that can be imparted it is also an occasion where networking and local knowledge can be shared. By the time this local report has gone to press the Sunshine Coast, Coolum meeting will have been held so the report on that will have to be another time.



## Tamborine and Northern Rivers Report

By Tom Silver, Avocados Australia Director

What feels like a prolonged and favourable summer has led to great fruit size and early maturities across the Northern Rivers Tamborine growing district. Even at the start of May, we are yet to see a significant autumnal cooling trend yet, which I imagine will only push dry matters even higher.

Crops remain patchy across the district, with some farms experiencing bumper crops whilst others are quite sparse. Quality seems to be quite good, most likely due to the good growing season.

At the end of April, a number Avocados Australia board members, CEO and senior staff had the privilege of a meeting with the Federal Agriculture Minister, the Honourable David Littleproud MP. The Minister was very generous with his time, and keen to learn about the success of our industry whilst also listening to what concerns we may have for the future. I thank the Minister for his time and look forward to the industry working with him into the future. More on page 17.



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Around Australia continued



Central New South Wales Report

By Ian Tolson, Avocados Australia Director



The summer heat, whilst continuing into autumn, has not reached the devastating temperatures of last year. Hopefully the weather will start to cool down soon.

Good, but not flooding rain has orchards looking fantastic and fruit is starting to size up nicely. Christmas Eve produced one of the worst storms this area has seen for a long time; thankfully it was just an amazing light show, pelting rain but no hail. Considering the number of storms this season we have only suffered a few blackouts but no damage to fruit or orchards.

Just for something different, the area experienced some earth tremors, the worst one registering 4.2. During a period of 10 days there were reports of around 19 tremors.

Most in the region are reporting an increase in yield for the coming season. Buoyed by the remarkable prices over the past few seasons, new plantings are continuing, especially in Comboyne. Land to plant avocados on is in high demand.

It is good to see growers are continuing with good orchard practices to ensure the best possible quality is delivered to packing facilities. We all know how our product is becoming something consumers can't go without, so we must reward them with a top-quality piece of fruit to keep consumer confidence and consumption growth.

The Avocados Australia regional meeting scheduled for this area on 5 June will get growers together just before/early into the harvest (more on the website at [www.avocado.org.au/events/upcoming-events/](http://www.avocado.org.au/events/upcoming-events/)). I hope to see you there and at future

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extension activities.

## North Queensland Report

By Jim Kochi, Avocados Australia Director



The Shepard crop was all but done in North Queensland at the start of April, as expected. The quality was expected to be very good as we went through one of our driest summers in years and I have not heard anything to the contrary. However, the weather in the tropics is so unpredictable that February to March is our peak summer rainfall season and it did live up to its reputation.

Some eye watering facts for you.

Rainfall	February total	Wettest 7 days	March total	Wettest 7 days
Atherton	303mm	276mm	550mm	451mm
Paddys Green, Mareeba	194mm	130mm	158mm	154mm
Dimbulah	92mm	58mm	160mm	151mm

Source of rainfall figures: Weather Underground website

Up until this monsoon event happened the Tinaroo Dam, which services the Mareeba-Dimbulah irrigation area, was at critical low levels and looking desperate for the coming dry winter

season. However, in the course of a few weeks it has risen to a comfortably high level. Also, aquifers in the Atherton/Tolga area have been replenished and will carry us through the rest of the year. It is a timely reminder for growers to consider their application of Phos acid strategy for phytophthora control under these circumstances.

Avocados Australia is hosting a regional meeting in Mareeba on 31 May (more on the website at [www.avocado.org.au/events/upcoming-events/](http://www.avocado.org.au/events/upcoming-events/)). I encourage everyone to attend to hear the latest industry updates, developments with avocado imports and exports, supply chain quality improvements and to receive a free copy of the new best practice guide developed by AHR.

It's a season for highs and lows, and that includes returns. The princely prices of January at \$65-70 a tray have morphed to peasant prices of \$36-45. This is mainly caused by an unregulated supply from the many packhouses in North Queensland and possibly from the consumer reaction to immature fruit supplied at the very start of the season. Consumers apparently have a longer memory than growers when it comes to fruit maturity and therefore the eating experience. My enquiries to Queensland DAF at Mareeba early in the season showed 50% of dry matter sample results failing, yet harvest still continued. This happens every year in North Queensland with Shepard and most other regions with Hass when the rush to start Hass harvest kicks in. These actions have consequences as we saw during the Shepard season, and again at the start of the Hass season.



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# Getting creative for our new campaign

In the midst of a bumper season, strong growth in consumer demand, and following the launch of the nation's first avocado pop-up café last year, growers have pushed the button on an innovative \$2.4 million marketing campaign.

Featuring television advertising and a strong digital push, the campaign was developed by Hort Innovation in close consultation with an avocado industry advisory panel, made up of a cross-section of Australian growers and stakeholders.

rates more than doubling from 40,000 tonnes in 2007 to almost 90,000 tonnes today," he said. "All of this has not happened through luck. As an industry, we have invested grower levy dollars into a range of marketing activities through Hort Innovation over many years."

Recent research and development activities includes work to help consumers squeeze avocados less, and improve fruit quality along the supply chain, among more than 20 other projects.

In line with its four-year levy investment plan, the industry aims to increase domestic demand for Australian avocados by at least 20% by 2021, in line with large production increases.

Hort Innovation avocados marketing manager Claire Tindale-Penning said a custom study into insights around consumer behaviour and perceptions of avocados was used to inform the new three-year marketing strategy.

"Research showed us that while avocados are rising in popularity, there is a need to shift them

from an infrequent part of the shopping list to an integral part of a happy, healthy lifestyle – which is what we aim to do through 'Smash an Avo'," she said.

"This new campaign is fresh, friendly and slightly cheeky. We think it has a little something that everyone can relate to."

See the new Australian Avocados television ad on YouTube: [www.youtube.com/watch?v=X1rPD-SlcxA](http://www.youtube.com/watch?v=X1rPD-SlcxA)



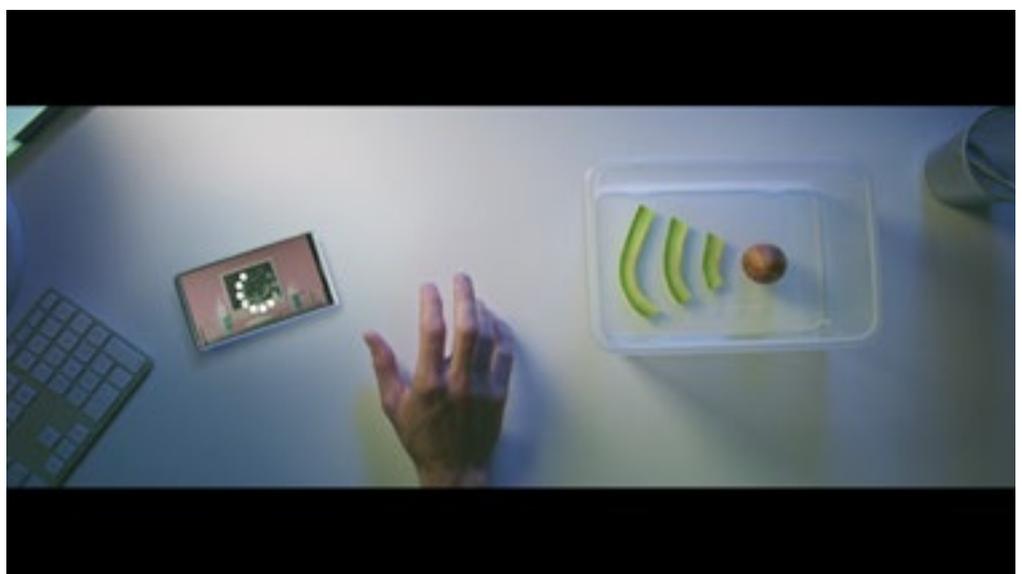
John Tyas, panel member and chief executive of the avocado industry's peak body, Avocados Australia, said the new 'Smash an Avo' campaign highlights what people love about the fruit. More on the industry's marketing on page 13!

"The campaign idea, 'Avocados make everything better – Smash an Avo', is inspired by everyday vernacular and the fact that avocados are so incredibly versatile, delicious and nutritious. It is brought to life in video with a quirky series of visuals that not only show how Australian Avocados make any meal better, but also how they make us feel good ... all with a good helping of topical satire."

"The plan is for people to see and hear about avocados everywhere – on Spotify, websites, YouTube, on digital screens at shopping centres, you name it."

Mr Tyas said the campaign complements what has been the rise and rise of Australian avocados.

"We are seeing a lot of quality product hit the market right now, and Australian consumers are enjoying more avocados than ever with consumption



# Hort Innovation Marketing update

*By Claire Tindale-Penning,  
Hort Innovation Marketing Manager*

Welcome to the Talking Avocado Autumn 2018 marketing update. It is an exciting period for Australian Avocados, with activity ramping up in the lead up to the launch of the new campaign that started on 29 April. More details about this, as well as the rest of the avocados activity that occurred, below. This activity is managed by Hort Innovation on behalf of the industry, and is funded by the avocado marketing levy.



## Smash an Avo

Following a very competitive pitch process, Ikon Communications was awarded the contract to develop the new Australian Avocados creative that will be used for the next

three-year marketing plan. The evaluation panel was made up of members from the avocado marketing sub-committee, including a selection of SIAP members and industry leaders, and Hort Innovation.

The creative process is now underway, with elements of the campaign including a new television commercial (TVC) which we shot in March, out of home advertising, social media and digital advertising.

## smash an avo



Key messages revolve around wellness and versatility, with the over-arching theme being 'Avocados make everything better – Smash an Avo'. Building confidence around selection, storage and ripening and repositioning avocados from a luxury item to an everyday item needed for a healthy lifestyle are further key messages for the campaign.

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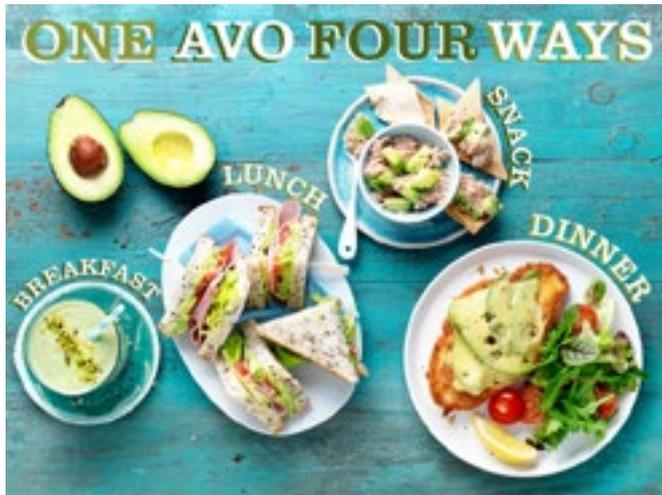
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These themes are driven by consumer research showing the biggest barriers to purchase (outside of price) are lack of confidence in selection, storage and ripening at home. The campaign elements will continue to remind people of the delicious taste, texture and feeling of wellness and vitality that comes with eating avocados, with new recipe ideas used to give further inspiration.

Consumer research was undertaken by Kantar Added Value to test the winning creative before the production of the television commercial and other creative elements occurred. Results were conclusive: the creative is hitting the mark. The feedback was overwhelmingly positive with the audience understanding and believing the message that “avocados make everything better”. The television commercial was launched on 29 April and will run until early June, across free to air TV, catch up TV and on various contextually relevant websites (health, food, lifestyle for example). It will be supported by large format digital screens outside 690 Coles and Woolworths stores across the major capital cities displaying the many ways “avocados make everything better”, and the “always on” social media strategy via Facebook and Instagram.

Consumer research was also undertaken, before refreshing the Australian Avocados logo. Visuals from the new campaign have been featured on the cover of this edition of *Talking Avocados*.

## Recipe development and photography

Australian Avocados has enlisted Myfoodbook to create and photograph new recipe content, and update the images of some existing recipes. Overall, 15 recipes were shot, alongside stop motion videos and infographics. These will be shared on the Australian Avocados and Myfoodbook websites, the Australian Avocados Facebook page, and also with media during the coming months in line with the new creative campaign for avocados. The inviting new imagery is designed to embed the notion of the versatility of avocados and the deliciousness

they bring to every dish: “avocados make everything better”. These recipes range from the more traditional meal ideas, to new ideas that follow up-and-coming trends. An example of this is the vegan avocado cheesecake (*pictured*). Veganism is going from strength to strength in Australia; in May-October of last year alone, searches for ‘vegan’ recipes online were up a massive 74% from the same period the year before. (Source: NewsCorp Mar 18.)

Another hot topic for consumers is food waste, and this is particularly true of avocados, where a consumer may use a quarter or half, but then forget the other half and end up throwing it away. This is a problem for many consumers who love avocados, but are price sensitive so don’t want to risk buying one and wasting half on it. This barrier was addressed in a shoot for ‘One Avo, 4 ways’ piece (*pictured*) providing consumers with inspiration for what they can do with the rest of an avocado. In these four dishes, one quarter (the recommended daily portion size of avocados) is used across four simple, delicious meals.

## Digital and cinema results

As detailed in the previous edition of *Talking Avocados*, Australian Avocados had an eight-week cinema campaign running from September to November, and a three-month digital campaign that was live from 10 September to 17 December 2017. The full results for these campaigns have been finalised, with both activities performing strongly. For the cinema activity, overall the two videos were shown 980 times during the campaign. The campaign performed very strongly, over-delivering against the goal by 7%. The activity was seen by more than 128,000 people in the target demographic (people aged 25-54), and in total was seen by more than 535,000 people in that eight-week period alone.

The digital campaign aimed to remind and inspire consumers of the versatility of avocados – “the perfect partner to so many other ingredients” – with the target audience being grocery buyers aged between 25-54. The main goal of the campaign was to reach more than 1.7 million eyeballs over its duration. The final results were excellent, with more than three million impressions delivered, well exceeding the goal; a single impression is counted when an ad is displayed on a website. Another important metric used to evaluate the campaign is the completion rate (CR). The completion rate is the percentage of people who watched the advertisement until the end, instead of skipping it. Completion rate is valuable, as it shows if the content is resonating with the target audience, as they are voluntarily choosing to watch it. For the perfect match campaign on YouTube, the completion rate was 37%, well ahead of the average industry standard rate of 25%, showing that the content was well received.

## Hort Innovation Marketing update



## Social media

With the Australian Avocados Facebook page ([www.facebook.com/AustralianAvocados/](http://www.facebook.com/AustralianAvocados/)) liked by more than 190,000 consumers, social media is an important part in the marketing strategy. We continue to see more fans flocking to the page, with nearly 3,000 new 'likes' since the last edition of *Talking Avocados*.

The aim of the consumer-facing Facebook page is to share content such as health facts, recipe ideas and hints and tips to consumers in a way that will resonate with the target audience, whilst keeping avocados top of mind for consumer's year-round. Each month, the content reaches more than one million people in Australia.

An example of the type of content posted is the healthy fat video (*screenshot pictured here*), extolling all the health benefits of an avocado. In just two days this video was viewed more than 121,000 times, reaching more than 192,000 views by 22 April.

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## Website

The Australian Avocados consumer-facing website (*pictured*) is regularly updated with new recipes and remains an important vehicle for both recipes and other key messages, such as health benefits and ripening tips. In February alone, there were nearly 20,000 visits to the website. Popular recipe trends include Guacamole, Dips & Smoothies, but there was also an increase in traffic for ‘how to ripen’ tips.

Guacamole recipe ads on Google continue to drive the highest volume of traffic to the website. With more than 22 million avocado recipe search results on Google, the search engine advertising allows the Australian Avocado website to be at the top of the first page of Google (*pictured*), increasing the number of consumers who use this as their source for recipes and avocado facts.

## Acknowledgement

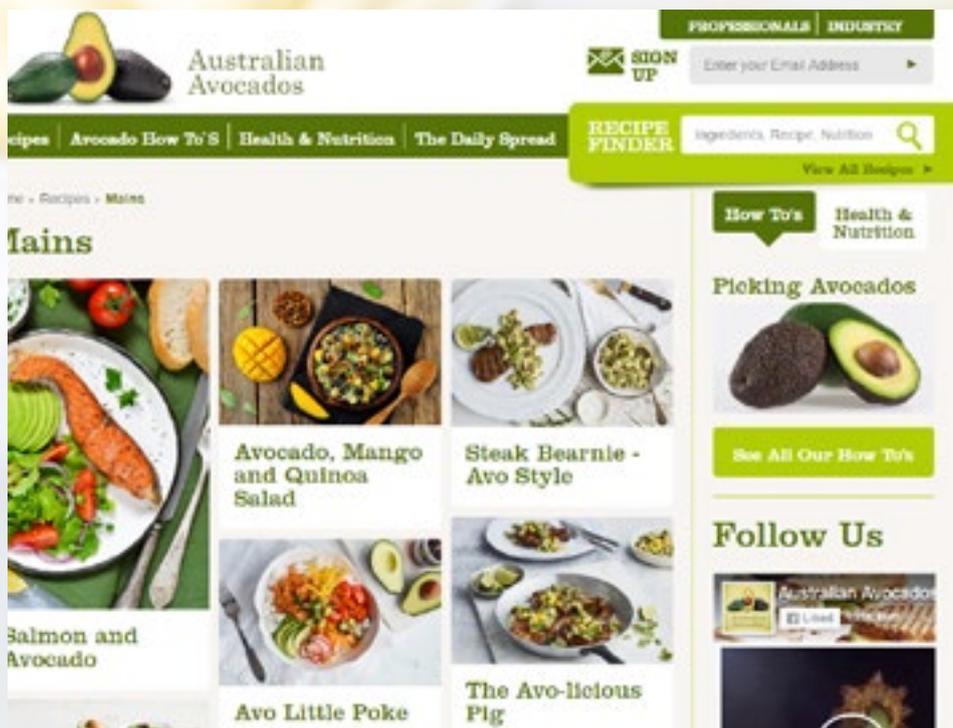
Marketing activity is managed by Hort Innovation on behalf of the industry under the Hort Innovation Avocado Fund; it is funded by the avocado marketing levy.

## More information

<http://australianavocados.com.au/>

Facebook: [www.facebook.com/AustralianAvocados/](https://www.facebook.com/AustralianAvocados/)

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# Avocados planning for sustainable growth

The avocado industry in Australia is a thriving rural industry, with a gross value of production of \$398 million in 2016/17.

This was some of the positive news Avocados Australia shared with Federal Minister for Agriculture David Littleproud, at the Sunnyspot Packhouse at Ravensbourne, Queensland on Thursday, 26 April.

Minister for Agriculture David Littleproud said the avocado industry had been innovative in the past and obviously planned to be so in the future.

"The avocado industry is ahead of the curve and the stats the industry has about where production and consumption is, and where it is likely to be in the future, shows it is making sure it remains a sustainable industry," Minister Littleproud said.

"The avocado industry has shown quite rightly they are innovators and taken the bull by the horns and are making sure they control the destiny of their industry, not anyone else."

Avocados Australia CEO John Tyas said the industry had worked hard to ensure demand grew in line with production.

"Domestic demand for avocados has reached 3.5kg/person per year in Australia and there are signs consumption will continue to increase," he said.



*Federal Minister for Agriculture David Littleproud (centre) with Sally Boardman, John Tyas, Daryl Boardman and Jim Kochi in late April.*

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Mr Tyas said the avocado industry had set itself one of the highest levy rates of any agricultural product, in support of research, development and marketing.

"We firmly believe in investing in our industry through levies because we've seen the results of almost three decades of investment success," he said.

"In 2007/8, Australia produced just 39,000 tonnes of avocados with a gross value of production of \$127 million. Last year, we had almost 66,000 tonnes with a gross value of production of \$398 million.

"In terms of farmgate returns, the value has more than tripled, from \$108 million back in 2007/8 to \$374 million in 2016/17."

Mr Tyas said there were avocado growing regions in various climates from Busselton in Western Australia to the Atherton Tablelands of North Queensland, to Stuarts Point in Central New South Wales, to Renmark in South Australia.

"As an industry, we realise the importance of continuing to improve the quality of our product, with improved practices from the farm and throughout the supply chain to the consumers."

# Australian market sparks interest

**The latest news in this space was the release in March from the Australian Government Department of Agriculture and Water Resources (DAWR) regarding Chile.**

DAWR has started a risk analysis process in response to a request for market access for fresh avocados into Australia. Market access for avocado has been Chile's highest priority request for horticultural export to Australia since 2006.

However, Avocados Australia CEO John Tyas says the big question is "why"?

"While Australian consumers love their avocados, we have a population of just 25 million people, making us a minnow compared to Chile's main export markets in Europe, the US and their growing Chinese market," Mr Tyas said.

"Naturally we believe the Australian avocado market is well served by domestic and New Zealand supply with lighter supply in January and February. However, current and future plantings aim to close that gap in the near future."

## Chile

While access to the Australian domestic market could be a shorter-term proposition for Chile, the country's avocado producers will have two main challenges in the Australian market:

- there are biosecurity requirements which first need to be met, and
- they will have to land their fruit in Australia economically and in a condition that meets Australian consumer expectations.

The assessment will help determine which potential pests are pests of quarantine concern that require phytosanitary measures to achieve Australia's appropriate level of protection. The quarantine pests associated with fresh avocado fruit from Chile (as assessed to date) are expected to require similar risk management measures to those already used to control these or similar pests on other horticultural commodities.

Given the similarity of pests of concern, and that there are appropriate risk management measures already established for these pests or pest groups, the risk analysis for fresh avocado fruit from Chile will be progressed as a review of biosecurity import requirements (a non-regulated risk analysis) by DAWR, consistent with the Biosecurity Import Risk Analysis Guidelines 2016.

"Our fellow avocado producers in Chile are going to have to meet the quality expectations of Australian consumers, which can be more challenging with very long transit times," Mr Tyas said.

"As an industry, we've worked exceptionally hard to ensure our consumers receive consistently high-quality fruit.

"On the flip side, Free Trade Agreements are now a standard part of doing international business. While such agreements will always benefit some industries more than others, it's important the Australian Government continues to ensure international access to horticultural markets. In fact, the Australian avocado industry has been very proactive in working toward accessing international markets in future years as production and plantings continue to increase and will eventually exceed domestic demand."



## Peru

An agreement that reduces tariffs on Australian horticulture into Peru was signed by the Australian Government in February.

However, Mr Tyas said this does not mean Peru can now export avocados to Australia.

“Again, there are very strict quarantine arrangements which need to be met and it takes many years to negotiate satisfactory market access protocols – just as we experience with our own market access aspirations into Asian markets,” Mr Tyas said.

“However, DAWR has confirmed that the Peru government formally lodged an application for avocado market access last year. In discussing this matter with DAWR, we understand that there are numerous market access applications for horticulture products ahead of Peruvian avocados, so it will be several years before the Peru application is progressed by DAWR.

“Nevertheless, Avocados Australia has taken steps in preparation by requesting Hort Innovation to commission a study into the potential commercial impacts of avocado imports from Peru and Chile. This work is currently being commissioned and will be in line with a similar study initiated last year looking at Mexico,” Mr Tyas said.

“It will help us to understand the likelihood of imports from these countries (if or when market access is granted), times of year they may target, likely transport routes, shipping times and landed prices. This information is very useful to assist with our longer-term industry planning.”

In addition to these studies, Avocados Australia will undertake a review and update of our biosecurity plan this year, and ensure that potential pest and diseases from Mexico, Chile and Peru are thoroughly investigated.

## Mexico

The continuing good news is that Avocados Australia have had confirmation from DAWR that avocados are not the next crop for which Mexico will be seeking market access to Australia.

Mr Tyas said Mexico had now listed limes as their top priority.

“However, Mexican avocados will be an ongoing threat that we need to be prepared for in Australia,” he said.

“The analysis that was undertaken last year was very informative. The report is confidential, of course. However, I will provide a summary of the insights at a series of industry regional meetings being scheduled over the next couple of months.”

## More information

[www.agriculture.gov.au/biosecurity/risk-analysis/plant](http://www.agriculture.gov.au/biosecurity/risk-analysis/plant)

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# New avocado markets imperative

## Joy Tang, Avocados Australia

Australian avocado production has increased significantly from 34,515 tonnes in 2005/06 to 66,716 tonnes in 2015/16 in response to domestic demand.

During the same period, consumption has increased at approximately 6.3% per annum, or from 46,103 tonnes to 78,276 tonnes.

However, the rapid rate of increase in avocado production has created an imperative for the industry to access and develop new markets. Avocados remain a relatively new food option and many consumers, particularly in overseas markets, are yet to become familiar with the product.

Based on production forecasts developed by Avocados Australia, domestic avocado production is likely to exceed 110,000 tonnes by 2025. This rate of growth is well above previous consumption growth and the expectation is that significantly more fruit will be marketed to off-shore markets as domestic market saturation increases. This may also be impacted by imports from other countries, such as Mexico, Chile and Peru if/when market access is granted.

The Avocado Strategic Investment Plan 2017-2021 has identified export development as a key priority. Outcome 3 in this plan states that 'By 2021, over 10 per cent of production will be exported to markets where customers have a willingness and capacity to pay a premium for Australian avocados'.

The *Avocado Export Readiness and Market Access Project* (AV17000) will ensure the avocado industry is prepared to export, maintain a robust industry capacity to pursue new and improved market access, and provide necessary support to the government in their negotiations. The project will enable the continued pursuit of the industry's market access and market maintenance goals in line with the recently delivered Avocado Export Strategy.

The project supports many export development activities to help the industry to reach its export potential. The initial project set up and planning has been completed. The project aims to achieve the following outcomes for the industry:



Joy Tang, Export Coordinator  
Avocados Australia

- an informed industry aware of export opportunities and requirements through targeted training programs and associated activities
- utilisation of new market access protocols by growers and exporters
- workable market access protocols negotiated for new markets
- increasing exports of avocado each season equating to 10% of national production by 2021
- continuity of export knowledge within the industry.

## Acknowledgement

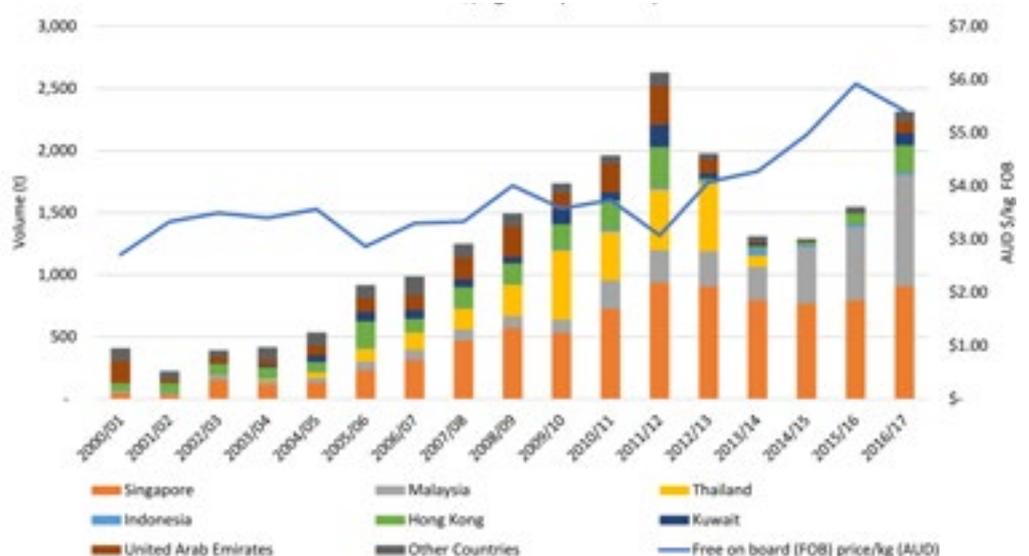
The *Avocado Export Readiness and Market Access Project* (AV17000) has been funded by Hort Innovation, using the avocado research and development levy and contributions from the Australian Government.

## More information

You can contact Joy Tang at [export@avocado.org.au](mailto:export@avocado.org.au) or 07 3846 6566.

Australian annual avocado export volumes in tonnes by country and AUD \$/kg FOB (blue line)

Source: IHS Global Trade Atlas (2017)



# Spreading the export message

## *Jenny Margetts, P2P Business Solutions*

Avocados Australia will be focussed on spreading the export message to all growers in the up-coming May/June regional meetings.

"As we come into the winter season, demand for Australian product in our traditional export markets is strong," Avocados Australia CEO John Tyas said.

"However, competition from other countries is only increasing in our export markets and the requirement for servicing the market with the highest quality product is now greater than ever.

"It is up to everyone in the supply chain to make sure that we get export right. It is so important for the prosperity of our industry as we move into a higher supply environment," Mr Tyas said.

Activities such as the 'Ripe & Ready' program, managed by Avocados Australia, and funded through DAWR's Package Assisting Small Exporters program (PASE), Sunfresh, The Avolution and the Avocado Export Company, are starting to gain traction.

"One of the challenges that we have had from the commencement of the program was the reluctance of retailers to offer a 'ripe' product for consumers," Mr Tyas said.

"This reluctance is typically driven by the additional cost and risk in providing this offering.

"However, we have been able to convince some key retailers

that there is a benefit of additional sales that warrants the investment in managing a 'ripe' offering and we are now starting to see the benefits of the work undertaken to date."

Although most Australians are familiar with avocados, this is not always the case with Singaporean and Malaysian consumers.

"They know that avocados are a healthy food option, so they are keen to know more about selecting and using the fruit in their diet," Mr Tyas said.

"By providing ripe-to-eat fruit that is easily identifiable takes one challenge out of the purchasing process for consumers."

To support the development of 'Ripe & Ready' program, Avocados Australia, with the support of Department of Agriculture & Fisheries Queensland and the exporters involved in the program, has been providing support and training to importers and retailers in key markets, as well as tailored information brochures for consumers.

"We are currently finalising our training and support material for all those involved in avocado export supply chains - from grower to exporter to importer to retailers in export markets - and will be making these resources available to the industry over the coming weeks."

## Acknowledgement

These market development activities are being undertaken as part of a project being funded by the Australian Government's Package Assisting Small Exporters Program, the Avocado Export Company, Sunfresh and The Avolution.



# Tropical fruit trade outpacing most other commodities

Jenny Margetts, P2P Business Solutions

The growth in the tropical fruit trade, especially avocado and mango, has outpaced that of most other food commodities, according to the latest Food and Agriculture Organization (FAO) *Food Outlook* report.

The report from the United Nations' organisation says innovations in distribution, trade agreement measures, population growth, and shifting consumer preferences driven by rising incomes, will continue to support further expansion ahead. This report is based on information available up to late October 2017.

"However, with tropical regions particularly susceptible to extreme climate-related events, uninterrupted supplies to international markets will be a significant challenge," the report says.

Despite this, the report says export volumes of the four major fresh tropical fruits – mango, pineapple, avocado and papaya – have displayed the fastest average annual growth rates among internationally traded food commodities, significantly outpacing growth in major food markets, notably cereals, livestock products, vegetable oils, sugar, and other fruits and vegetables.

## Avocado has the strongest growth

"Globally, avocado and mango are the two tropical fruits that have witnessed the strongest growth in popularity.

"Between 1990 and 2017, world import demand for avocado increased at an annual average growth rate of 14%, significantly

outperforming supply and, thereby, driving up export, wholesale and retail prices."

In fact, the report says import demand for avocado has exhibited much more resilience to changes in income (when compared with other tropical fruit), especially during the past decade, as demonstrated by its uninterrupted robust growth in both major import destinations, the USA and the EU.

"Wholesale prices in the USA, the largest importer of tropical fruits, have shown a tendency to reflect global market developments...wholesale prices of avocado have registered a steep rise in response to severe supply shortages from Mexico, reaching US\$6.20/kg on average in September 2017, up from an average of US\$2/kg in December 2016," the report says

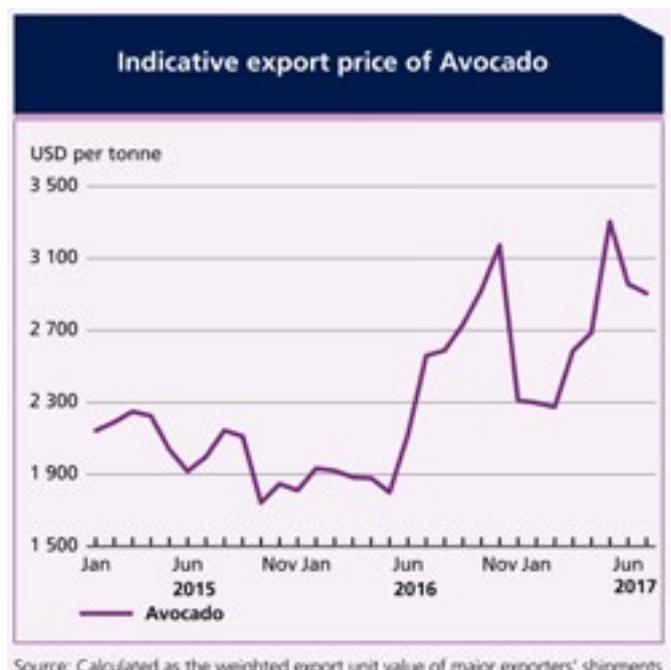
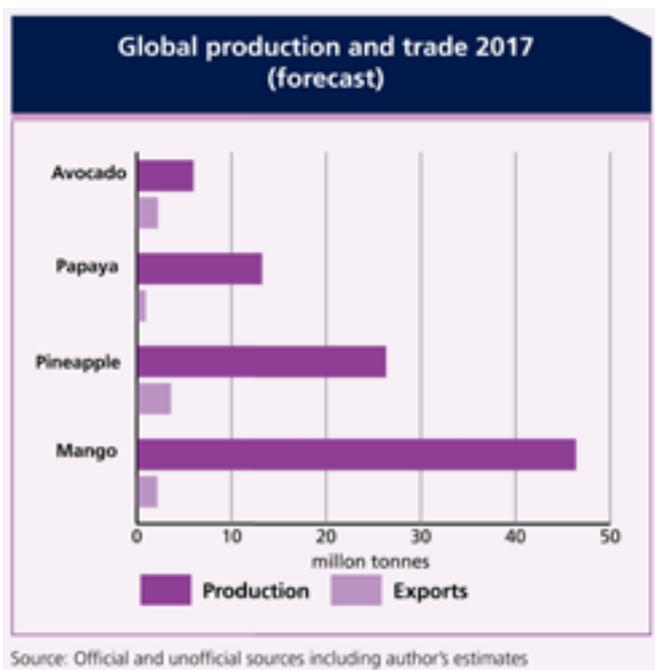
In China, as in other developing import markets where recently introduced fruits such as avocado are considered luxury items, novelty price premiums are the main driver of retail prices.

## Demand for ripe and ready

"As tropical fruits are becoming more widely available in developed countries, consumers have started to display a higher propensity to spend on tropical fruits that are ripe and ready-to-eat, tree-ripened instead of warehouse ripened, and organic, allowing for higher price levels and profit margins at the retail level. As with other maturing food markets, demand for organic produce is burgeoning."

The FAO *Food Outlook* report says avocado is "particularly well positioned" to benefit from an expansion in import demand.

"Notwithstanding prospects of increased demand in developed



countries, exporters should also target potential demand in emerging economies, notably India and China, where increasingly affluent populations could give rise to greater product inflows," the report says.

"Global production of avocado is estimated to reach 5.8 million tonnes in 2017, which would represent a 3.4% increase from 2016. On the back of rapidly growing global demand, avocado, among all the major tropical fruits, has seen the fastest production growth over the last decade, with an estimated 5.6% average annual increase between 2007 and 2016, primarily due to increases in harvested area in the major producers."

Nevertheless, in global production terms, avocado remains the smallest of the major tropical fruits.

"As a share of production, trade in fresh avocados is the highest of the major tropical fruits and (was) estimated to reach 33% in 2017," the report says.

In terms of fresh fruit retail availability, the world's largest import markets are growing, reaching 3.6kg per capita in the US in 2017 and 1kg per capita in the EU for avocado. (It's higher in the key avocado-consuming markets of France and the UK, with an estimated 1.6kg and 1.3kg per capita, respectively.)

"Demand for avocado has been supported by the fruit's assumed health benefits related to its very high nutritional value," the report says.

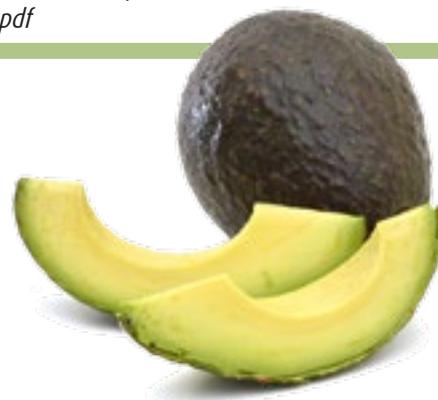
"Import demand for avocado has also shown a strong performance in Asia, particularly in China, the Republic of Korea and Japan.

"Imports by China are expected to increase 20% above its 2016 imports, reaching an estimated 44,000 tonnes in 2017.

"In light of the attractive remunerative opportunities that avocado offers, Chinese growers have started to expand the production of avocado for domestic consumption."

## More information

*Food Outlook* is published by the Trade and Markets Division of FAO under Global Information and Early Warning System (GIEWS). A copy of the full report can be found at [www.fao.org/3/a-18080e.pdf](http://www.fao.org/3/a-18080e.pdf)



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**AUSTRALIA WIDE**



# Market supply data vital for planning

## Sue Plunkett-Cole, Avocados Australia

Avocado Australia’s data program is running smoothly, with the project *Avocado industry and market data capture and analysis* (AV16006) into its second year this April.

For more than 10 years *Infocado* and OrchardInfo reporting have been informing avocado industry participants, providing vital information for market supply planning and industry development decisions. Our contributors tell us they use the reports as a vital piece of the puzzle in managing their avocado businesses.

Our data verification activities indicate that between 80% and 90% of supply is captured in the system, and Avocados Australia invests a significant amount of effort in maintaining this excellent rate of contribution.

Preparations begin soon for mid-year reporting with the final quarterly *Infocado* report for the financial year, followed by the annual avocado industry statistics, and the 2018 tree census.

In addition to the well-established *Infocado* and OrchardInfo programs, the project is developing a global trade data analysis and reporting framework to support the project *Avocado export readiness and market access* (AV17000).

We are in the process of streamlining the data capture and reporting for *Infocado* and OrchardInfo, and look forward to revealing this simplified approach towards the end of the year.



## Acknowledgement

The project *Avocado industry and market data capture and analysis* (AV16006) has been funded by Hort Innovation using the avocado industry research and development levy and contributions from the Australian Government.

## More information

To find avocado industry statistics and reports, visit [www.avocado.org.au/news-publications/statistics/](http://www.avocado.org.au/news-publications/statistics/) and [www.avocado.org.au/our-programs/supply-chain-data/](http://www.avocado.org.au/our-programs/supply-chain-data/)

For more information on the avocado industry data program, please contact Sue Plunkett-Cole or Amanda Madden on 07 3846 6566 or [infocado@avocado.org.au](mailto:infocado@avocado.org.au).



Sources: *Infocado*, Avocados Australia analysis using Ausmarket Consultants data and Freshlogic assumptions

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# Plantings increase in NQ and WA

Sue Plunkett-Cole, Avocados Australia

Interesting regional trends for avocado tree plantings have been revealed by the 2017 OrchardInfo report.

While Central Queensland has the largest proportion of Australia's planted hectares (27%), the region's share of hectares planted with one and two-year-old trees is only 15%.

By comparison, North Queensland and Western Australia regions have been planting at a higher rate during the last two years than the other regions. North Queensland's proportion of total hectares is 24% and their share of trees planted since 2016 is 31%. The WA/NT region has 20% of total hectares and 28% of those with 0-1 year old trees.

Interestingly, Western Australia has a much higher tree density per hectare than North Queensland, as can be seen in the graph below (Figure 2). The columns show hectares by region and the yellow squares are total number of trees. Western Australia has 85% of the hectares that North Queensland has, but two-thirds more trees.

In terms of varieties, Western Australia has the highest proportion of Hass, with 99% of hectares planted to the Hass variety. North Queensland has the lowest proportion of Hass at 41% with an additional 6% of other Hass types (Maluma, Turner, Carmen and Lamb Hass) and 53% Shepard.

Plantings in the last two years have increased the Hass proportions in all regions, with Hass-like varieties also on the increase.

While Hass dominates the new plantings in all regions, 11% of new plantings in North Queensland in the last two years were to Maluma Hass. In the same period Tristate growers planted 8.5% of hectares with "other" variety types: 4% Lamb Hass; 3.5% Edrinol; and 1% Gem.

Tamborine Northern Rivers planted 5%, and Central Queensland 4.5% of hectares with "other" variety types since 2016.

All growers who contributed to the 2017 OrchardInfo Tree Census received a detailed report showing data for all regions.

## Acknowledgement

The OrchardInfo tree census is undertaken under the umbrella of Avocado Australia's Infocado data program, under project *Avocado industry and market data capture and analysis* (AV16006).

## More information

If you are an avocado grower and would like to contribute to OrchardInfo in order to receive the annual report, please contact Sue Plunkett-Cole or Amanda Madden on 07 3846 6566 or [infocado@avocado.org.au](mailto:infocado@avocado.org.au).

Proportions of all Australian avocado hectares (at 1/8/2017)

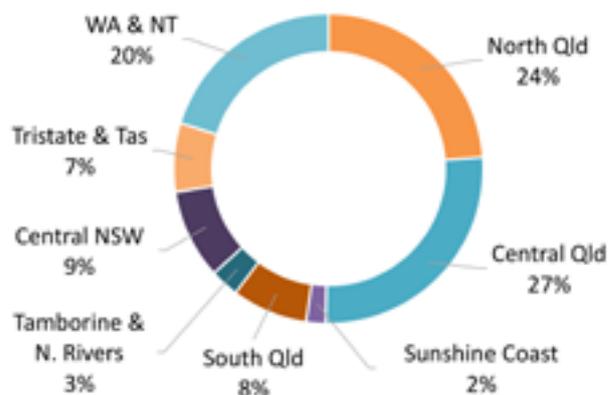
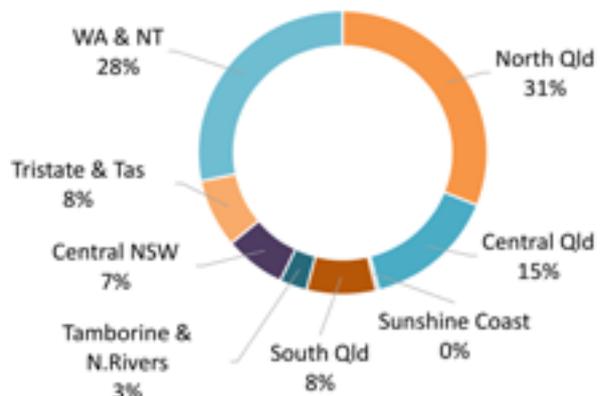


Figure 1. National plantings (above) and the proportion that is plantings since 2016 (below). Source: OrchardInfo.

Proportions of Australian avocado hectares planted since 2016 (at 1/8/2017)



Australian hectares of avocado plantings by variety and tree numbers (yellow box) at 1/8/2017

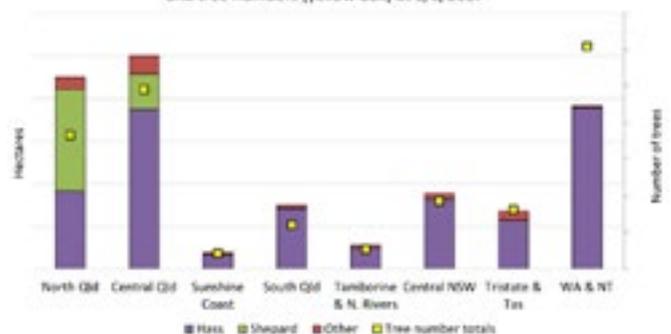


Figure 2. Variety hectares and tree numbers for each region. Source: OrchardInfo.

# Hone your avocado leadership skills

Avocado growers will have the opportunity to develop their skills in leading their industries and their own businesses. The Leadership Exploration and Development (LEAD) program is a collaboration of Australian tropical fruit industries – avocado, melon, pineapple, banana, passionfruit, strawberry, persimmon, mango and lychee.

Avocados Australia has secured seven free places for avocado growers to hone their leadership skills as part of this program.

The successful grower applicants will take part in pre-program activities, residential workshops, a webinar program and mentoring. There are two rounds or “Groups”, each with a different start date. Applications have now closed for the first round of submissions. However, we are still seeking additional participants. If you are interested, please apply by 30 May.

The cost of LEAD is free, with accommodation provided. However, participants will be responsible for their own travel, breakfast, one dinner, taxi fares and beverage costs throughout the two residential workshops.

Avocados Australia Chief Executive Officer John Tyas said horticultural industries needed both the current and next generation of industry leaders to lead through transitional and structural adjustments.

“One of the biggest barriers to building leadership skills is the cost of training and lack of available funds,” Mr Tyas said.

“Via this funding, seven future avocado industry leaders will be provided with the opportunity to develop relevant skills, network with government and other stakeholders, and increase their cross-industry knowledge.

“This leadership program will further increase collaboration between our industries as the program benefits from the existing networks and skills base of the Tropical Horticulture Group members.”

The LEAD program will help build skills in a wide range of leadership areas, ranging from developing strategic alliances through to conflict resolution and organisational governance.

The face-to-face workshops will be held in Brisbane and Canberra. The Canberra workshop will provide participants with first-hand experience to understand how Canberra ticks and develop their lobbying skills.

## Acknowledgement

This LEAD program has been made possible through the Leadership in Agricultural Industries Fund, administered by the Department of Agriculture and Water Resources to support Australian agricultural industry.

## More information

You can find full details of the application process (including a downloadable Word version of the application form), as well as details of the various activity timing online:

[www.avocado.org.au/public-articles/lead2018/](http://www.avocado.org.au/public-articles/lead2018/).

Alternatively, please call Lisa Yorkston on 07 3846 6566 or email [co@avocad.org.au](mailto:co@avocad.org.au).

	<b>Workshop 1</b> Positioning your organisation to the external environment	<b>Workshop 2</b> Creating the organisation you want
<b>Group 1</b>	2-4 July 2018	2-4 October 2018
<b>Group 2</b>	12-14 November 2018	4-6 March 2019
<b>Location</b>	Hotel Kurrajong, Barton, Canberra	Hotel Adina Anzac Square, Brisbane
<b>Content</b>	<ul style="list-style-type: none"> <li>• Developing strategic alliances</li> <li>• Optimum structures – active representation</li> <li>• Influencing through communications</li> <li>• Public speaking skills</li> <li>• Effective lobbying</li> <li>• Networking externally</li> </ul>	<ul style="list-style-type: none"> <li>• Developing desired culture</li> <li>• Understanding self</li> <li>• Decision making</li> <li>• Team dynamics</li> <li>• Managing teams</li> <li>• Conflict resolution</li> </ul>
<b>Webinars</b>	<ul style="list-style-type: none"> <li>• Crisis management</li> <li>• Understanding international trade</li> <li>• Understanding and managing biosecurity</li> <li>• Leading &amp; managing organisational change</li> <li>• Social media</li> <li>• Organisational governance</li> </ul>	

# New Best Practice resources

A host of new material has been added to the Best Practice Resource on the Avocados Australia website since the last edition of *Talking Avocados*.

## New video

Maintaining healthy soil is one of the keys to tree health and productivity. A published study on avocado found the use of mulch increased yields by 23% and increased fruit weight by 7%, over three years. Learn more about mulching in the new video from the Queensland Department of Agriculture and Fisheries, Hort Innovation and Avocados Australia in the Growing module of the BPR on the Mulching page.

## Market research

A new report about avocado buyer segmentation has been added to the BPR Library, in the Marketing Reports section. This research helped inform the avocado industry's 2017-2020 strategic marketing plan. The primary objective of the research was to understand avocado consumers in terms of the different types of consumer segments, their barriers and triggers to purchase, their purchasing behaviour, usage behaviour and a profile of who they are.

## Have you checked out the Learning module?

There has been an exciting major new addition to the BPR for 2018. The new Learning module provides registered BPR users with access to online learning in five key industry areas including growing, packhouse, ripening, transport and wholesale. You can choose to complete any of the courses, as they are offered individually, for example, if you are a ripener, you may only want to complete the ripening course.

## What's new in the BPR

To make it easier to keep up with what's new in your BPR, we've added a handy link to the BPR homepage. Once you have logged in, the main page will provide you with a link to the what's new page, where you will find a summary of new content and links.

## Acknowledgement

The content of the Best Practice Resource is maintained through the project *National avocado industry communications program* (AV15002), which is a strategic levy investment under the Hort Innovation Avocado Fund.

## More information

You can log in (or request access!) via [www.avocado.org.au/best-practice-resource/](http://www.avocado.org.au/best-practice-resource/).



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# Avo squeezing is bad: science

Acoustic tools, laser technology, ultrasounds: scientists are trying it all to stop consumers from bruising avocados when testing them for ripeness.

In a survey of Australian avocado consumers, 97% admitted to squeezing the fruit before purchasing it. And research shows consumers 'test', on average, three times more fruit than they actually buy.

A new study – being funded by Hort Innovation and conducted by the Queensland Department of Agriculture and Fisheries (QDAF) in collaboration with The University of Queensland and Avocados Australia – is aiming to limit damage to avocados by giving consumers more options to identify ripeness.

Hort Innovation chief executive John Lloyd said significant investment had been made into research and education tools to support the careful handling of the fruit from picking to shop shelves, and identifying how to limit avocado squeezing in store is the next step.

"Past research that has been conducted through Hort Innovation has identified various ways to ensure the careful handling of the fruit during the picking, packing and freight stages to ensure consumers are receiving the best quality avocados possible," Mr Lloyd said.

"This new work looks beyond that at what studies have shown to be the most dangerous time for the fruit: when it is exposed to consumers," he said.

QDAF lead researcher Professor Daryl Joyce said his team is looking at education, point-of-sale signage, technology and packaging options to limit injuries to Aussie avocados on shop shelves.

He said any squeezing or compression events generally cause enough damage to show as bruising of the fruit flesh, and it takes about 24 hours for this to develop and become visible.

"It has been found that shoppers typically apply compression forces ranging from 3 to 30 Newtons (N) to firm-ripe avocado fruit when assessing ripeness. For context, a 'slight' thumb compression of 10 N applied to a firm-ripe fruit causes bruising to appear within 48 hours at 20°C."

Prof Joyce said previous research shows most consumers do not link their 'bad avocado experience' with excessive handling. "Only 42% of shoppers surveyed agree with the statement that 'bad avocados have been handled or touched too much'."

He said studies had shown that most consumers considered that posters at the point of purchase the most useful for avocado selection, and tips on storage, ripening and usage. Arranging displays into different ripeness categories has also been shown to reduce fruit handling by shoppers.

"A prototype decision-aid tool, based on a force-sensing resistor placed between the thumb and the fruit, was also recently developed and tested by scientists for in-store use. In-store surveys found the device was favourably received by shoppers but it is still some time away from commercialisation."

The research project, *Supply Chain Quality Improvement – Technologies and Practices to Reduce Bruising*, is due for completion in October.

Avocados Australia chief executive John Tyas said for now, if consumers needed to 'test' fruit for ripeness, they should gently press the stem end only. He also said consumers should not fear buying fruit that is not yet ripe.

"Your store-bought avocado should ripen within a few days as the ripening process will have already begun. If you want to be sure, simply put the fruit in a bag with a banana," he said.

"However, if the fruit has already started to ripen this will not make it ripen any quicker."

During the 2016/17 financial year, more than \$5.3 million was invested in research, development and marketing for the avocado industry through Hort Innovation.

Grower enthusiasm and passion for a strong and vibrant industry recently led to the Hort Innovation Board meeting with the Avocados Australia Board to discuss industry priorities now and into the future to further build upon the rise and rise of the Australian industry.

## More information

You can read more about the project in the R&D section of this edition of *Talking Avocados*.



Image: Sha Liao



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# New avocado supply chain resources

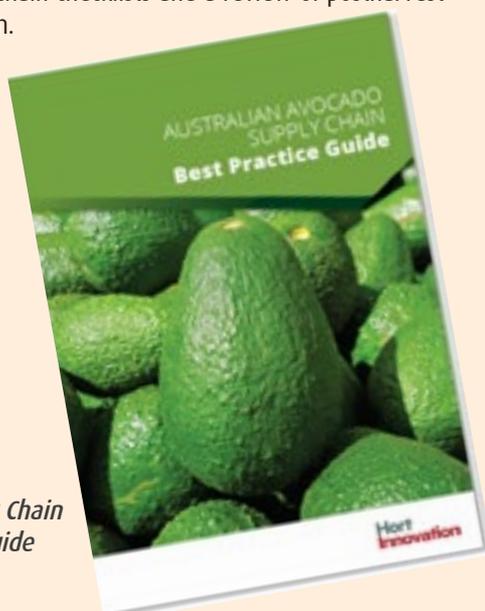
*Adam Goldwater, AHR*

Four exciting new resources have been developed for the Australian avocado industry.

While previously developed materials for the industry have all been valuable sources of technical information for stakeholders, some gaps were identified in post-harvest materials and therefore updates were required to incorporate new research and technology.

The aim of the supply-chain-focused material is to increase awareness of post-harvest factors affecting avocado quality, and ensure the supply of consistent, high-quality fruit to customers.

The new resources include something for everyone, with a supply-chain best practice guide, a fruit-quality problem solver manual, supply-chain checklists and a review of postharvest avocado research.



*Australian Avocado Supply Chain Best Practice Guide*

This guide summarises best practice recommendations from grower to transporter to retailer.

It includes guidelines on how the key factors affecting avocado quality can be managed to supply consistently high-quality fruit. It also demonstrates (at each stage of the supply chain) how losses in quality can occur if best practice is not followed.

The guide has a strong focus on temperature management, which is one of the most critical factors in maintaining postharvest quality.

## Avocado Fruit Quality Problem Solver

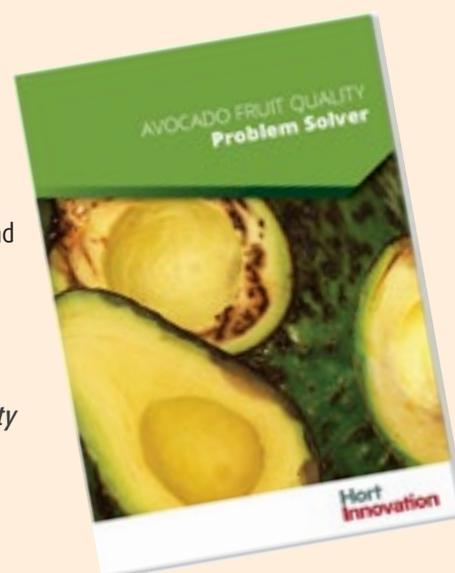
Designed to be used in conjunction with the best practice guide, it outlines the major fruit quality issues that can occur as avocados travel through the supply chain.

The focus is on postharvest issues and includes external and internal defects as well as ripening- and storage-related

problems.

The problem solver can be used to help you identify a problem, find out what is causing it and how to minimise or prevent it.

*Avocado Fruit Quality Problem Solver*



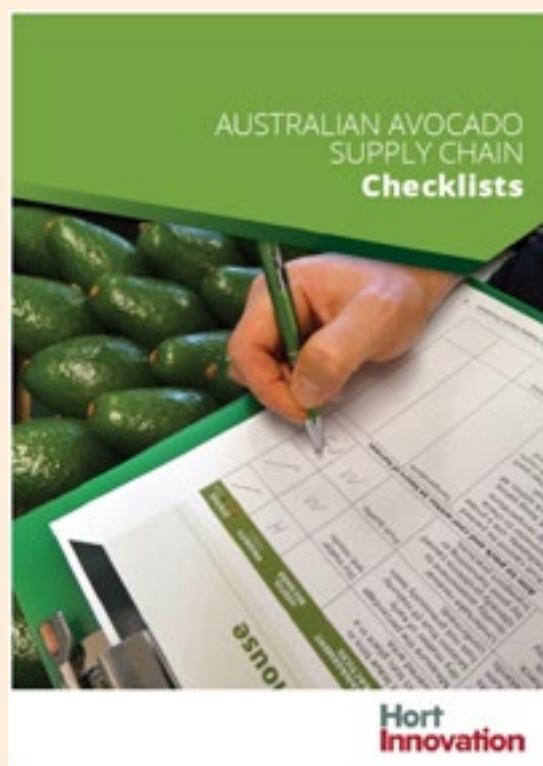
## Australian Avocado Supply Chain Checklists

The checklists summarise the key actions needed to maintain the postharvest quality of avocados.

A number of records are suggested, as a way of ensuring activities are correctly performed and recorded.

Space is left for the business to determine which processes have the highest priority and the status of each activity can be noted by the relevant staff.

The checklists should be reviewed regularly to allow system improvements from month to month and season to season.



New avocado supply chain resources continued

## Review of Best Practice

There is an opportunity to dig deeper into factors affecting post-harvest quality of avocados via a detailed review of international avocado research.

With thousands of peer-reviewed papers written on post-harvest management of avocados, this document summarises that information in an easy-to-read format.



## Workshops coming to you

To get your copies of the new resources, and learn more about them, come along to a workshop in your region during the coming months.

Lessons from packhouse and supply chain studies from across the country will be presented, including how harvest practices can reduce quality, how to get the most from fungicides and sanitisers, investigating whether to pre-cool or not to pre-cool, and checking whether you're getting the transport temperatures you paid for.

Workshop dates are:

- Renmark, SA – 21 May
- Mareeba, Qld – 31 May
- Stuarts Point, NSW – 5 June
- Childers, Qld – 7 June

Requests for printed copies of the resources can be made by email to: [sandra.marques@ahr.com.au](mailto:sandra.marques@ahr.com.au). The four resources will also be available for download from the library section of the Avocados Australia Best Practice Resource.

## Acknowledgement

These resources have been developed as part of the *Cool Chain Best Practice Adoption Project* (AV15010) project which is funded by Hort Innovation, using the avocado industry levy and contributions from the Australian Government.

## More information

Adam Goldwater from Applied Horticultural Research at [adam.goldwater@ahr.com.au](mailto:adam.goldwater@ahr.com.au) or phone 02 8627 1040.



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# Eating up six-spotted mite

## – a pest in the west in avocado orchards

*Stewart Learmonth, DPIRD and Lachlan Chilman, Biological Services*

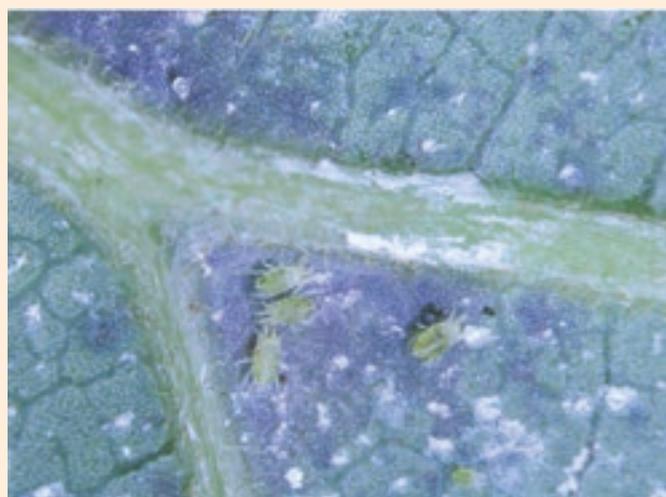
A collaborative project is looking to determine whether predatory mites can reduce six-spotted mite numbers in West Australian avocado orchards.

The two-year project, between the Department of Primary Industries and Regional Development Western Australia (DPIRD) and Biological Services, began in 2016.

### History and West Australian extent

Six-spotted mite (SSM) is an accidentally introduced pest mite in Australia, from Central America and can be distinguished from other pest mites by the presence of at least three dark spots on each side of its body (*Figure 1*). It occurs in avocado orchards in eastern Australia but is not considered a pest there. SSM was first recorded in Western Australia (WA) in 1986 but it was not until spring 2014 that severe defoliation in avocado orchards occurred (*Figure 2*). To prevent fruit in defoliated trees from becoming unmarketable as a result of sunburn, trees were strip picked early. Such action is counter to controlled harvesting and runs the risk of glutting the market, with a resultant fall in returns.

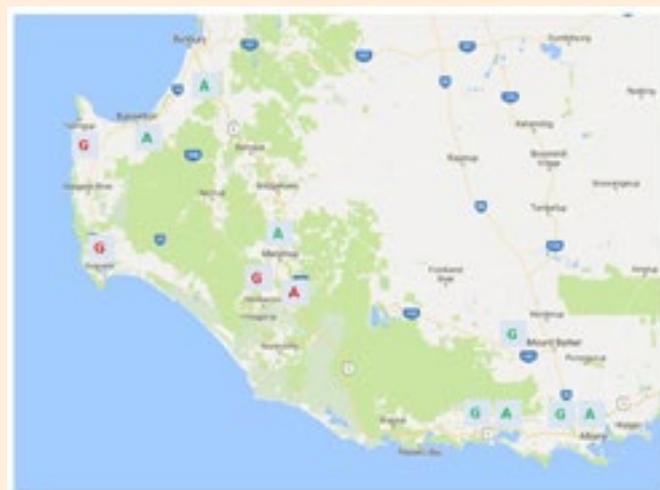
The extent of SSM as a pest in WA seems to be restricted to orchards only in the lower south-west around Pemberton. Avocados grown just to the north in the Manjimup area, which are infested with the mite, have not suffered defoliation. The mite has yet to be recorded in avocado orchards in the Albany and Busselton regions, or further north around Perth.



**Figure 1.** Six-spotted mite can be distinguished from other pest mites such as two-spotted mite by the presence of at least three dark spots on each side of its body.



**Figure 2.** Infestations of six-spotted mite on avocado trees can result in near complete defoliation rendering fruit subject to sunburn and adversely affecting tree vigour.



**Figure 3.** The known occurrence of six-spotted mite (SSM) in relation to avocado and grape growing regions of south west Western Australia and within those regions where six-spotted mite has required control: Red 'A' and 'G' = SSM as a pest in avocado orchards and grapevines respectively. Green letters signify either SSM absent or presence of SSM without damage.

SSM affects grapevines with premature leaf fall also. In WA, a similar situation of restricted geographic extent of the pest exists – only grapevines in the Margaret River and Pemberton wine growing regions are adversely affected by SSM. (*Figure 3*)

Eating up six-spotted mite – a pest in the west in avocado orchards continues

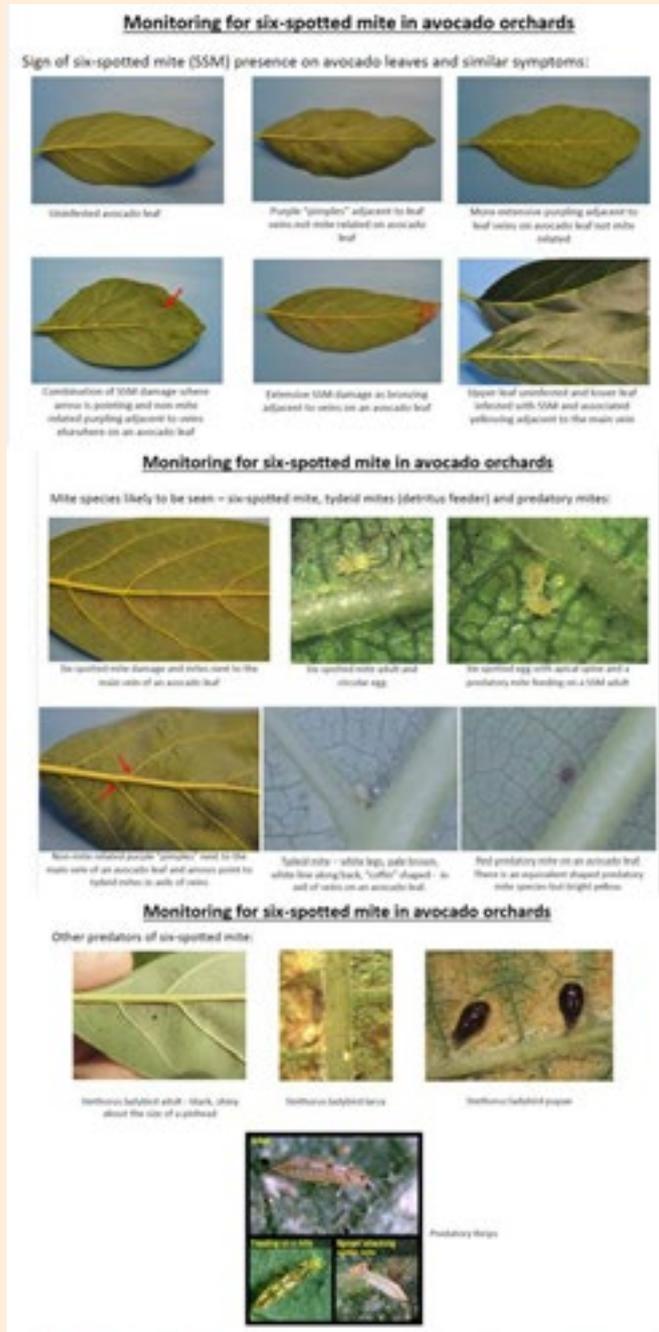


Figure 4. A monitoring guide for avocado growers to assist them in recognising six-spotted mite (SSM), look-alike species, characteristic damage to avocado leaves by SSM and look-alike symptoms as well as the key natural enemies of SSM.

The role of predatory mites

Prior to 2014, avocado production in WA was virtually free of the need to use pesticides, with the exception of treatment to protect trees from the root disease *Phytophthora cinnamomi*. To control SSM, the use of miticides has been required to prevent defoliation.

Infestations of SSM have been accompanied by the presence of a 'naturally occurring' predatory mite *Euseius elinae*. Its numbers have been high at times but does not always protect trees from SSM.

In 2016, we commenced a two-year project to assess the role of predatory mites – both this naturally occurring species and others available commercially. We developed an identification guide to assist WA avocado growers to monitor for SSM (Figure 4).

To assess the effect of predatory mites, we monitored infested orchards where we released two new species: *Metaseiulus* (= *Typhlodromus*) *occidentalis* and *Neoseiulus californicus* in 2016, and a third species *Typhlodromus doreenae* in 2017.

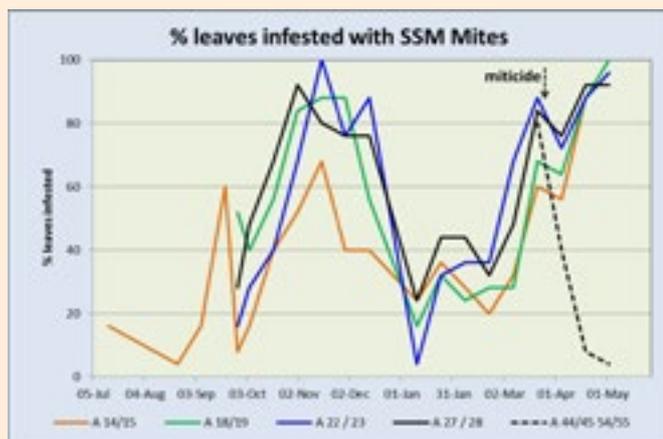
The first series of releases was made in late spring/early summer 2016 in four orchards. Neither predatory mite appeared to have established to affect SSM to obviate the need to use miticide.

Since that time, a greenhouse study compared the efficacy against SSM of *M. occidentalis*, *N. californicus* as well as the naturally occurring *E. elinae*. Results suggested that *M. occidentalis* was the most effective predator. This species was subsequently released in late January 2017. After an early increase in predatory mite numbers, the population growth of SSM was too rapid to be contained by the predators.

The third species of commercially available predatory mite, *T. doreenae*, has been confirmed to feed on SSM in a laboratory situation. This species was released in small areas in avocado orchards in late spring 2017; we continue to monitor the outcome of those releases.

With our monitoring to date we have noticed there is a natural decline in SSM abundance in avocado orchards over summer. While do not understand the reasons for this, it provides an opportunity to time the releases of predatory mite near the end





**Figure 5.** This graph indicates the typical fall in six-spotted mite abundance over summer in avocado orchards in Western Australia, a time when controls such as release of predatory mites could be considered.

of harvest to limit the build-up of SSM before winter.

For the remainder of this two-year project, ending in June 2018, we will be directing our attention to assessing whether a mid-summer release of the predatory mites *M. occidentalis* and *T. dorenae* can reduce SSM populations and limit the use of miticides in avocado orchards (Figure 5). Other ways of increasing the levels of naturally occurring *E. elinae* are occurring also.

## Acknowledgement

The *Pest status and management of six-spotted mite (Eotetranychus sexmaculatus) in WA avocado orchards (AV15012)* has been funded by Hort Innovation, using the avocado industry research and development levy and contributions from the Australian Government, the West Australian Department of Primary Industries and Regional Development, and Biological Services.

## More information

Jamieson L.E. and Stevens P.S. (2007). Development rates, longevity and fecundity of six-spotted mite (*Eotetranychus sexmaculatus*) at constant temperatures. *New Zealand Plant Protection* 60:72-77. ([www.nzpps.org](http://www.nzpps.org))

Rogers M.E. and Stansly P.A. (2015) University of Florida IFAS Extension. 2016 Florida Citrus Pest Management Guide: Ch. 10 Rust Mites, Spider Mites, and Other Phytophagous Mites. <http://edis.ifas.ufl.edu/cg002>

'Six-spotted mite - pest of grapevines and avocados'. Article on DPIRD website: [www.agric.wa.gov.au/avocados/six-spotted-mite-pest-grapevines-andavocados](http://www.agric.wa.gov.au/avocados/six-spotted-mite-pest-grapevines-andavocados)

University of California Pest Management Guidelines, Avocado, Six-spotted Mite. Article on UC website: <http://ipm.ucanr.edu/PMG/r8400311.html>

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# Does impact injury at harvest increase body rots at retail?

*Melinda Perkins, Muhammad Mazhar, Daryl Joyce, Noel Ainsworth, Lindy Coates and Peter Hofman*

In spite of burgeoning demand for avocados, meeting consumer expectations for fruit quality is an ongoing challenge.

Recent monitoring of avocado fruit quality in Australian retail stores found that body rots were the second most common internal quality defect, after flesh bruising<sup>1</sup>. Body rots are most often the result of a fungal disease known as anthracnose. Symptoms initially appear as light brown circular lesions and enlarge to produce sunken dark-brown or black areas on the fruit surface, sometimes with salmon-pink spore masses in the centre of lesions (*Figure 1*)<sup>2</sup>.



**Figure 1.** Anthracnose in Shepard avocado fruit.

Symptoms can be harder to detect externally in Hass fruit, however, due to the blackening of the skin during ripening. In the course of our research on avocado bruising, we noticed that unripe fruit subjected to impact injury seemed to be more prone to body rots when they ripened. We decided to investigate the issue further. Here, we provide an overview of the anthracnose infection process and how mechanical wounding of avocado fruit might trigger the disease. Findings from our preliminary experiments are also presented.

## Evidence for impact-induced body rots

Hass avocado fruit subjected to either a 50cm or 100cm drop height at the hard green mature stage using a swing arm



**Figure 2.** Swing arm device used in laboratory experiments to apply controlled and consistent impacts to fruit.

device (*Figure 2*) showed no signs of flesh bruising, but began exhibiting body rots seven days after impact when held at 20°C<sup>3</sup>. Between seven and 15 days after impact, body rots frequently occurred at the impact site in one or two of the five different fruit assessed daily from each drop height treatment.

By comparison, no rot development was found in non-impacted control fruit. The finding prompted us to undertake preliminary research into this phenomenon. We found that a drop height of 30cm incurred on the day of harvest significantly increased the number and size of body rots expressed at the impact site in Hass fruit at the soft ripe stage (*Figure 3*).

However, no significant difference in body rot incidence or severity was observed between non-impacted fruit and fruit subjected to a 15cm drop height. Whilst these initial findings provide evidence of a link between impact injury and body rot expression, large-scale experiments conducted across multiple seasons and orchards are needed to validate the relationship. Formal identification of the causal pathogen is also required.

## What triggers anthracnose?

The symptoms of anthracnose usually develop on avocado fruit as they ripen after harvest. However, initial infection generally occurs in the orchard during fruit set and development<sup>4</sup>. Spores of the fungal pathogen (which could be one of a number of different *Colletotrichum* species now known to be associated with anthracnose in avocado) are deposited on the fruit surface



No impact

Impact from 30cm drop height

**Figure 3.** Flesh surface of 'Hass' avocado fruit subjected to no impact (left) and impact from a 30cm drop height (right) on day of harvest showing differences in body rot expression at soft-ripe stage.

by water dispersal (e.g. rainfall). Under the right conditions, spores germinate to produce infection structures called appressoria, which anchor themselves firmly to the surface of fruit. Appressoria then germinate to produce a short infection peg in the cuticle of the fruit skin<sup>5</sup>. At this point, fungal growth stops and the pathogen remains dormant or 'quiescent'.

Identifying the triggers that activate pathogen growth upon fruit ripening has been the focus of much research.

Avocados have been shown to produce six natural defence compounds that are toxic to *C. gloeosporioides*<sup>6-9</sup>. The most abundant is generally a triene compound called Persenone A<sup>10</sup>.

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## Does impact injury at harvest increase body rots at retail? continued

However, a related diene compound called persin has received the most attention as it is more potent or 'fungitoxic' than other defence compounds<sup>7-9</sup>. Persin levels in the peel rapidly decline after harvest<sup>7, 11</sup>, which partly explains why ripe fruit are more susceptible to body rots than unripe fruit.

Ripening also causes the pH of the peel to increase, which in turn triggers the pathogen to release a tissue-degrading enzyme called pectate lyase<sup>12</sup>. The pathogen itself is capable of altering fruit pH by releasing ammonia into the fruit tissues, further hastening body rot development<sup>13</sup>.

A favourable balance of mineral nutrients in the fruit can help combat anthracnose. Fruit with low nitrogen levels, high calcium levels and/or a low nitrogen to calcium (N:Ca) ratio tend to be less susceptible to body rots<sup>14-19</sup>. Calcium ions bind with pectic substances in the cell walls, making them less accessible to cell wall-degrading enzymes produced by the pathogen<sup>20</sup>. It is also suggested that avocado fruit use calcium ions as a signal to initiate defence responses to pathogen invasion<sup>21</sup>. Nitrogen, on the other hand, promotes anthracnose. Nitrogen is used by the pathogen to produce ammonia and trigger secretion of the pectate lyase enzyme<sup>22</sup>. The more nitrogen the pathogen can access, the greater the amount of enzyme it secretes<sup>23</sup>.

Once the infection process has been activated, the rate of disease development will largely depend on the temperature and humidity at which the fruit are held. Body rots can be limited by ensuring fruit are not wet when harvested, cooling fruit to 5°C (for Hass) as soon as possible after harvest, application of post-harvest fungicides and ensuring ripening temperatures do not exceed 24°C.

### How might impact injury promote anthracnose?

Cell damage at the site of impact becomes immediately apparent in freshly harvested unripe avocado fruit, even though bruising may not occur<sup>24</sup>. Cells of unripe fruit are relatively elastic, but magnetic resonance imaging suggests that cellular fluids are forced out of the cells and into surrounding air spaces upon impact<sup>24</sup>. Injured fruit may respond with a rapid increase in respiration rate and accelerated softening<sup>25</sup>. Other types of mechanical injuries to avocado fruit produce similar responses. Increased respiration rate<sup>26</sup>, ethylene production<sup>26, 27</sup> and tissue softening<sup>26</sup> were observed in unripe avocados subjected to cutting injury.

Most of these responses are indicative of early ripening and (as discussed above) ripening is a trigger for anthracnose development. However, our preliminary studies found that whilst impact injury of hard fruit often promoted body rots, it did not hasten fruit softening. Other researchers also reported that impact injury does not promote ripening of avocado fruit<sup>28</sup>. This may mean that other factors contribute to impact-induced body rot development.

Changes in the levels of antifungal defence compounds in response to injury may be one factor. Freshly harvested avocado fruit subjected to multiple puncture wounds showed an initial spike in persin levels after 24 h<sup>29</sup>, but this was followed by a rapid decline to sub-fungitoxic levels<sup>9</sup> six days after wounding. Whether antifungal compounds decrease more rapidly in impacted fruit than in non-impacted fruit is not known. If they do, then it may help to explain the greater body rot expression seen in response to impact injury.

### Where to next?

Despite some evidence that impact injury promotes postharvest disease in avocado, rigorous research is needed to characterise and confirm the relationship, and to determine the potential economic consequences for industry stakeholders. Better understanding of underlying causes for impact-induced anthracnose is also needed, as existing information is limited and sometimes contradictory.

The current project (AV15009) will begin by monitoring body rot development in pre-impacted freshly harvested Hass avocados as they progress through actual and laboratory-simulated supply chains. Results will be compared with those obtained for non-impacted control fruit subjected to the same supply chain conditions. Data could then be used to predict final fruit quality and subsequent profitability in response to differing supply chain management practices.

### Acknowledgement

The *Supply chain quality improvement – Technologies and practices to reduce bruising* project (AV15009) is funded by Hort Innovation, using the Hort Innovation avocado research and development levy, co-investment from the Queensland Department of Agriculture and Fisheries, the University of Queensland, Avocados Australia Ltd and contributions from the Australian Government.

### References

A full list of the referenced works in this review article can be found online at [www.avocado.org.au/news-publications/talking-avocados/feature-articles/](http://www.avocado.org.au/news-publications/talking-avocados/feature-articles/).



# New projects to improve productivity through disease management

Avocado diseases, particularly phytophthora root rot, continue to have major impact on orchard productivity.

There are two project teams working on a new industry-funded project *Improving Avocado Orchard Productivity through Disease Management* (AV16007), with the ultimate objective of minimising the effects of high priority diseases on avocado productivity, with the primary focus on the orchard production environment. Professor Giles Hardy and Associate Professor Treena Burgess, from Murdoch University in Perth, are experts in phytophthora root rot causing decline in natural ecosystems, with key skills in identification of different phytophthora species and evaluation of sensitivity to phosphonate amongst isolates of the oomycete pathogen. Dr Liz Dann and her team (University of Queensland, UQ), based in Brisbane, have been supporting industry with avocado disease management research and extension for a number of years.

While there is no indication that phosphonate has become ineffective, or will be withdrawn from use, the new project presents the opportunity to determine the range of sensitivity in the broad phytophthora population collected from orchards where phosphonate has been used for decades. The Murdoch team will also conduct a large glasshouse trial to address the question "What is the critical concentration of phosphonate required in roots to protect them from *Phytophthora* infection and colonisation?"

Two other components of the Murdoch group's research include testing a high-throughput enzymatic assay for quantifying phosphonate in avocado tissue, and determining effects of long-term use of pesticides, for example copper and glyphosate, in the orchards on soil health.

In a complementary study, Graeme Thomas is collaborating with the UQ team to test fruit from orchards in each growing region for phosphonate residues, in order to optimise the timing of phosphonate applications for maximum translocation to roots with minimal residues in fruit. This activity has commenced already and the team has received several Shepard samples from North Queensland and Bundaberg/Childers.



Liz Dann, UQ and Graeme Thomas, GLT Horticultural Services



Associate Professor Treena Burgess, Murdoch University

The project will not solely focus on phytophthora. A key activity will be field trials to assess a range of treatments for their efficacy in improving tree health, yield, and fruit quality, for example silicon, biologicals, soil conditioners and new chemistries, if appropriate.

Other activities of the project are related to the causal organisms of stem end rot, branch and graft dieback, treatments to suppress black root rot, and field disinfestation and management options for *Phellinus* brown root rot.

Importantly, the research and project outputs from both teams will be communicated frequently to industry, via field days and articles in future editions of *Talking Avocados*. A key output will be the enhanced capacity in orchard productivity research, development and extension, via mentoring, training and strengthening linkages within Australia and internationally. An early career researcher, Liz Cziolowski has been appointed to work with Liz Dann at UQ, and a PhD student has recently commenced at Murdoch University, supervised by Giles and Treena with co-supervision by the UQ team. The collaboration between the two teams will strengthen the research base and result in enhanced outcomes for industry. Linkages with related projects including *Avocado Industry Biosecurity Capacity Building* (AV16010) and the *Avocado Nursery Voluntary Accreditation Scheme review* (AV16013) will continue.

## Acknowledgement

The *Improving Avocado Orchard Productivity through Disease Management* (AV16007) project is funded by Hort Innovation, using the avocado research and development levy and contributions from the Australian Government. This project is jointly supported by the Department of Agriculture and Fisheries and the University of Queensland.

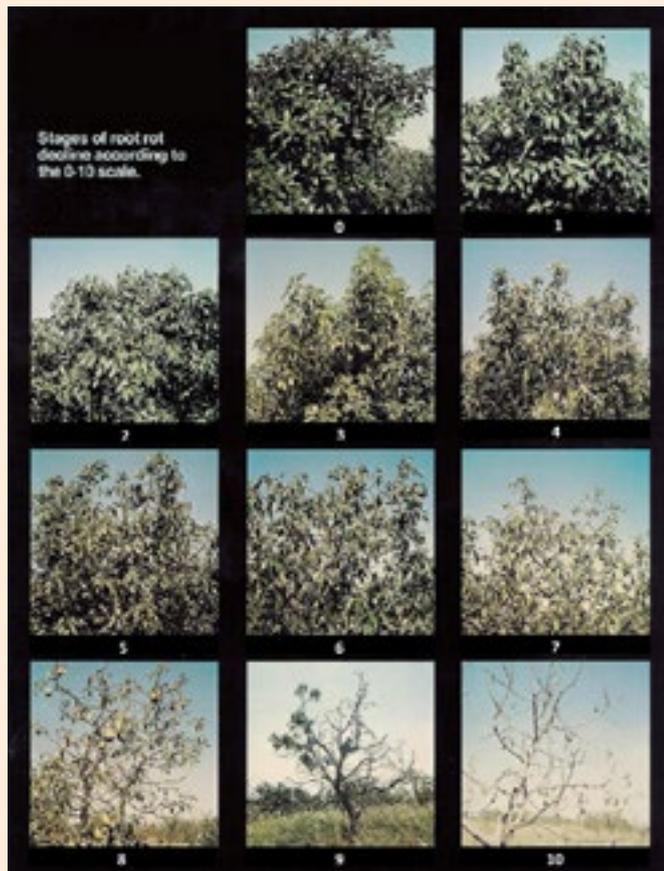
# Getting smart: rating PRR severity in avocados

Surantha Salgadoe, University of New England

Phytophthora root rot (PRR) is in the top list of diseases threatening Australian avocado industry. In 1989, a high incidence of PRR in California resulted in a loss of US\$40 million, whilst in Australia a high incidence in 1974 resulted in a 50% loss in productivity. Managing the disease has been a challenge due to late diagnosis and subjective methods of ranking disease severities.

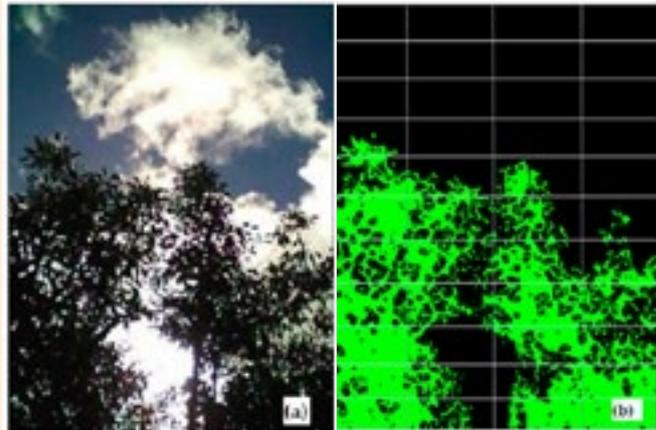
PRR disease is caused by the soil-born pathogen *Phytophthora cinnamomi*. Symptoms of infection include root loss, a reduction in water and nutrient uptake, canopy decline and eventually tree death. Theoretically, the severity of PRR disease is ranked visually into 10 categories (Ciba-Geigy method, *Figure 1*) according to the stage of canopy decline or porosity (proportion of sky area visible within the canopy).

However, in practice the number of categories used by Avocado growers in the Bundaberg region of Central Queensland was



**Figure 1.**

Ciba-Geigy Phytophthora root rot disease severity ranks (or canopy decline ranks).  
 0 & 1 - Very healthy (no decline), 2- Healthy (no decline),  
 3 - Early decline, 4 - Early decline to moderate decline,  
 5 - Moderate decline, 6 - Moderate to severe decline,  
 7 - Severe decline, 8 - Very severe decline,  
 9 - Almost denuded, 10 - Complete denuded.



**Figure 2.** (a) RGB Image from mobile phone  
 (b) Image analysing for calculating canopy porosity percentage; sky (black) and canopy area (green).

found to be four. Whilst the visual based rankings can provide an accurate measure of the spatial and temporal distribution of PRR severity, discrepancies can occur when others undertake the assessment, or it becomes difficult to distinguish between early declining canopies from those that are healthy. In order to prevent non-reversible damage from PRR, it is essential that early detection is achieved and the appropriate remediation is undertaken to arrest further decline.

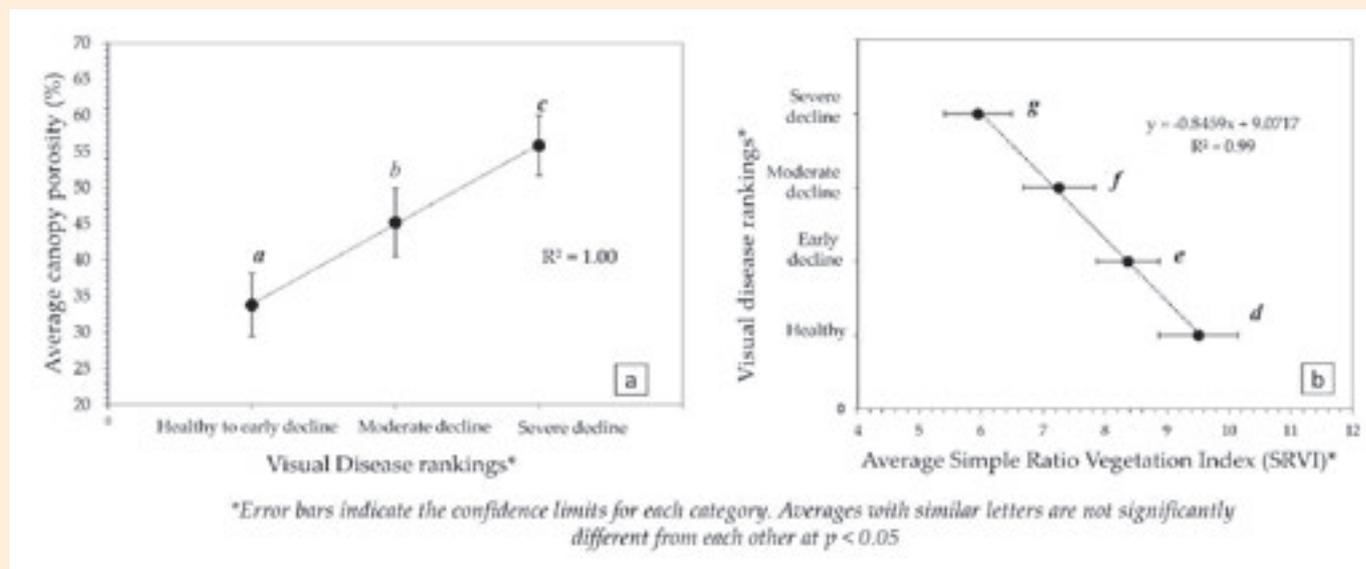
The following article presents two assessment methods that have the potential to complement the currently adopted visual assessment method.

Recently published research from Precision Agriculture Research Group (PARG), University of New England, introduced a remote sensing method to quantify the severity of PRR disease using images from mobile phones and as well as from satellite to complement eye ball assessments.

The information gathered from each method (mobile phone and satellite) was correlated against Ciba-Geigy visual estimations of 80 trees ranked for PRR disease severity. Red, Green and Blue (RGB) digital mobile phone images (*Figure 2a*) taken on the shaded side of each tree, were analysed to calculate canopy porosity percentage (*Figure 2b*). The results from the study showed that processed images from the mobile phone could accurately categorise avocado trees into three severity levels (*Figure 3a*).

Coinciding with the mobile phone approach, high spatial resolution Worldview-3 satellite imagery (31cm, 8 spectral band) was also acquired over the Ciba-Geigy rated trees. Canopy reflectance of the 100 trees was extracted from the imagery allowing for a number of structural and pigment based vegetation indices to be calculated.

Out of the indices tested the Simple Ratio Vegetation Index (SRVI) produced the highest relationships to the visually assessed categories of PRR disease severity (*Figure 3b*). Using



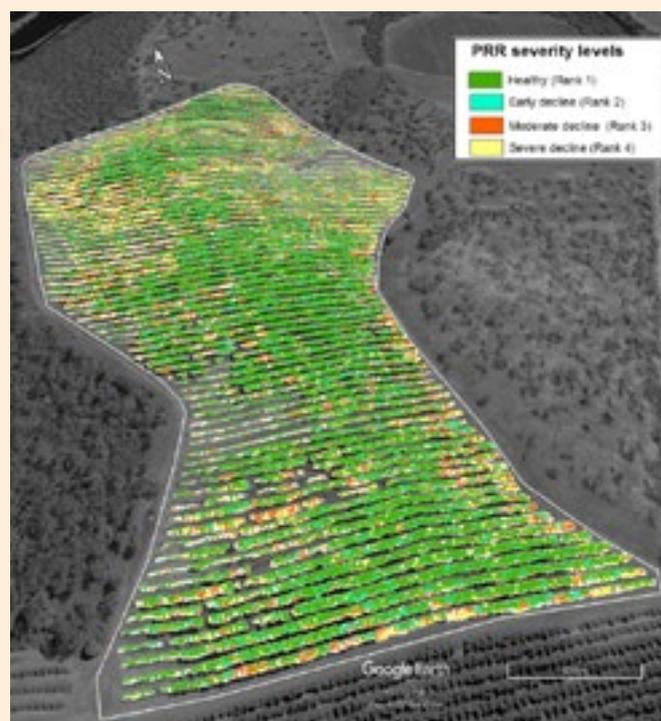
**Figure 3.** Graphical interpretation of confidence limits relating (a) average derived porosity values (b) average SRVI values to visual disease ranking category.

this relationship, all trees within the orchard block were classified into the modified Ciba-Geigy categories (Figure 4). The classified map clearly identifies PRR severity to be at its highest towards the east and west boundaries of the orchard. These regions are at the lowest elevation and therefore most subjected to waterlogging, an environment that is highly conducive to PRR infection. The high elevation central area of the orchard exhibited low PRR incidence most likely the result of improved drainage. The ability to generate PRR severity maps from satellite without the need to visually survey every individual tree presents significant time efficiencies for growers as well as allows the spatial and temporal variation of PRR to be quickly assessed.

The initial results from this study have identified both the mobile phone and satellite technologies offer some potential for standardising and automating the ranking of PRR infected trees. Following further validation, the next step of the project will be to develop practical pathways that will deliver these technologies to growers.

## Acknowledgement

Surantha Salgadoe is a PhD student at the Precision Agriculture Research Group, University of New England, Armidale, NSW, supervised by Associate Professor Andrew Robson, Professor David Lamb, Dr Elizabeth Dann from Queensland Alliance for Agriculture and Food Innovation, University of Queensland, Brisbane and Dr Christopher Searle. The project is funded by Australian Federal Government Rural Research and Development for Profit scheme and Hort Innovation. The project team greatly appreciate the support for this research from Simpson Farms Pty Ltd, in particular Chad Simpson.



**Figure 4.** PRR severity distribution map of the avocado orchard classified according to SRVI and superimposed over an elevation layer.

## More information

The full research article is available at [www.mdpi.com/2072-4292/10/2/226](http://www.mdpi.com/2072-4292/10/2/226)

# Market research underpins new campaign

The avocado's new marketing plan (more on that on pages 12-16 of this edition) has been underpinned by market research undertaken by Quantum Market Research in 2017.

The primary objective of the research was to understand avocado consumers in terms of the different types of consumer segments, their barriers and triggers to purchase, their purchasing behaviour, usage and a profile of who they are.

The research was also designed to provide input into the types of communication or activities which will increase consumption among each segment, to ensure consumer demand continues to increase in line with industry supply, without a detrimental impact on prices.

Stage 1 (a qualitative exploration) included both in-depth interviews and focus groups while Stage 2 (quantitative measurement) included an online survey.

The in-depth interviews were used to explore and unpack the attitudes of avocado buyers to construct a meaningful questionnaire to quantify the various segments. The in-depth interviews held across Melbourne and Sydney were split by those who were:

- high frequency avocado consumers (ie, buy at least two or more avocados a week)
- mid frequency avocado consumers (buy one or two a week)
- low frequency avocado consumers (one or maybe no avocados a week)
- infrequent avocado consumers (only a few occasions each year).

The Melbourne and Sydney focus groups included high, mid and low/infrequent consumers while the 1,000 online survey respondents were screened to ensure they were the main grocery buyers and purchased avocados on at least a few occasions per year.

The market research found that 69% of adult Australians are avocado buyers. Of this, 23% are heavy buyers (at least two per week), 27% medium 2 buyers (one or two per week), 27% medium 1 buyers (often one but sometimes none per week) and 24% light buyers (Figure 2).

The research found that most avocado buyers could be considered lovers/enthusiastic to some extent.



Figure 1. Source: Quantum Market Research report, 2017.

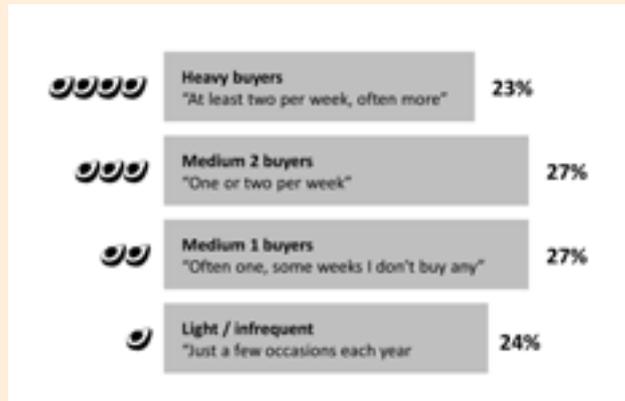


Figure 2. Avocado buyers are broadly spread across four different consumption volume categories.

Source: Quantum Market Research report, 2017.

"Unlike other grocery basics, buyers are naturally inclined to think of avocados in an emotional context. The only other fruit/vegetable found to elicit such reaction is mango (in Victoria/NSW).

"As popularity has increased, love/enthusiasm for avocado is no longer such a useful metric to segment buyers (Figure 5). It is the expression of their interest which is most useful to distinguish (segment) them by (Figure 3)."

The segments are (Figure 4):

- unfamiliar unsure (10%) – these buyers tend to be older, living regionally who dislike cooking or don't cook at all, unknowledgeable about buying/using avocado
- everyday routine (21%) – those who buy avocados as part of managing the household, these buyers consider avocados a staple ingredient and shop and eat the same meals routinely, and they are confident and satisfied with using avocado

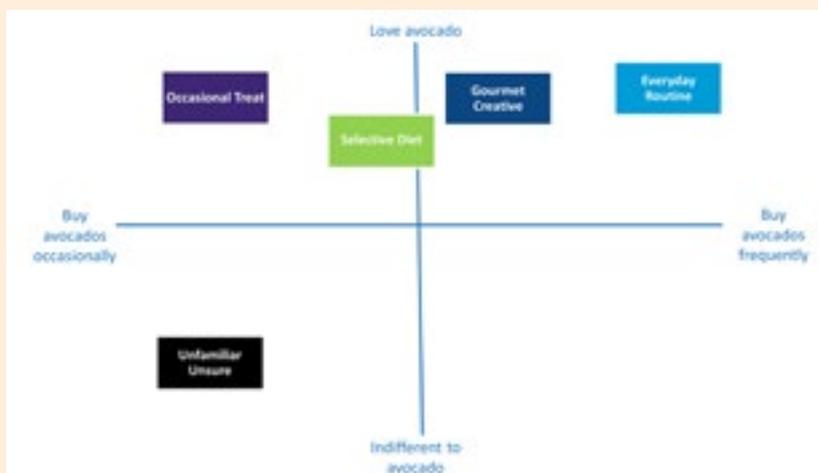


Figure 3. Positioning of segments by their love of avocados and frequency of purchase. Source: Quantum Market Research report, 2017.



Figure 4. Overview of avocado buyer segments. Source: Quantum Market Research report, 2017.

- occasional treat (21%) – for these buyers, avocado is a luxury they can't always afford, they are very price sensitive and are often dissatisfied with quality once purchased
- selective diet (21%) – avocado doesn't always suit those with a selective diet, as they stick with foods they know, considering avocado an occasional/seasonal food, they are not well educated about buying/using avocado and are price and quality sensitive
- gourmet creative (27%) – are passionate about food and love avocados, they explore new recipes, and are open to using avocados in new ways.

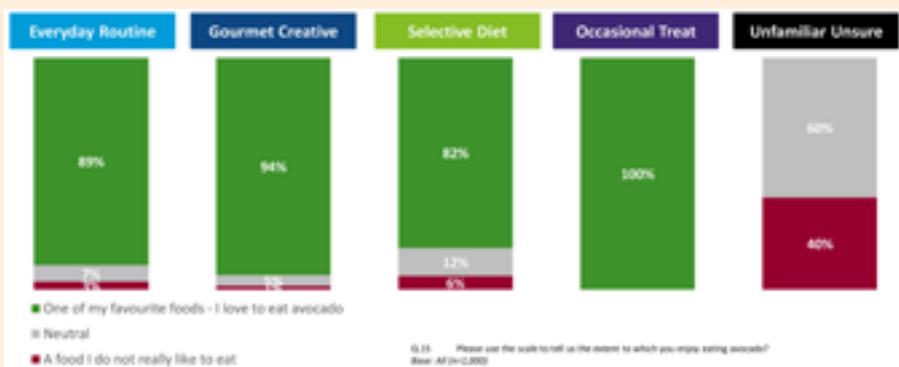


Figure 5. Comparison of segments by their love of avocado. Source: Quantum Market Research report, 2017

In terms of future marketing for avocados, the research found there was widespread agreement that avocado is very healthy (Figure 6 and Figure 7). The four key segments (everyday routine, gourmet creative, selective diet and occasional treat) connected with avocado as "nourishing/wholesome" and "pure/unprocessed".

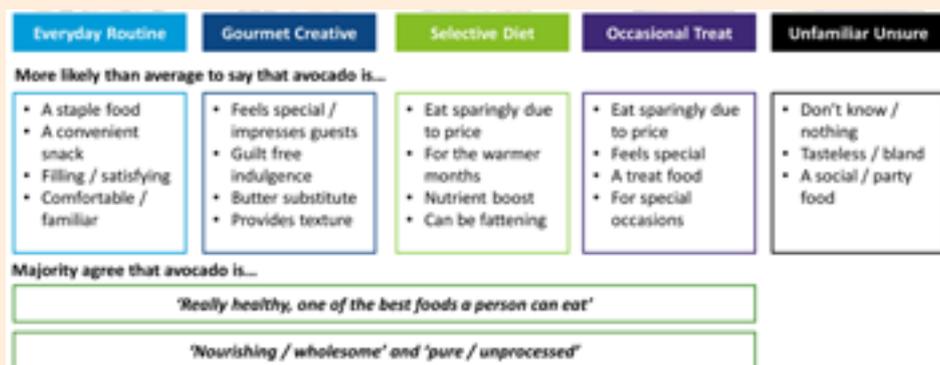


Figure 6. Comparison of segments by how they relate to avocado. Source: Quantum Market Research report, 2017.

The research found a number of common thoughts on why this is so:

- avocado is more likely to form part of a healthy meal (e.g. a salad), or to provide balance by being the healthy component of a meal (e.g. accompaniment to fried breakfast)
- it makes an otherwise bland healthy meal palatable. Some express that by adding a rich/creamy texture, avocado renders and otherwise unappetising salad more appealing to them

- avocado is filling/satisfying without being something to avoid as carbs/meat can sometimes be perceived. Sustaining, rather than just satisfying a craving. Perceived to leave one 'full but fresh', not sluggish
- considered to be nutrient dense/a 'superfood'. Buyers feel they are doing a good thing for themselves when eating an avocado
- can be considered a treat, but without all the usually guilty connotations which come as baggage with indulging oneself
- thought to be delivered from farm to plate with minimal interference. Relative to other fresh food, avocado does not come with concerns about being artificially grown or ripened.

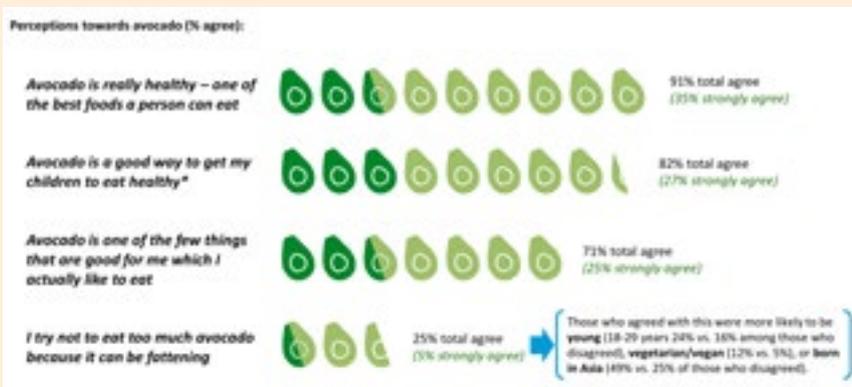


Figure 7. Widespread agreement that avocado is very healthy. Source: Quantum Market Research report, 2017.

The research uncovered a range of drivers for increasing consumption (Figure 8 and Figure 9), information that has helped underpin the new campaign.

### More information

The full Quantum market research report is available in the BPR Library at [www.avocado.org.au](http://www.avocado.org.au).

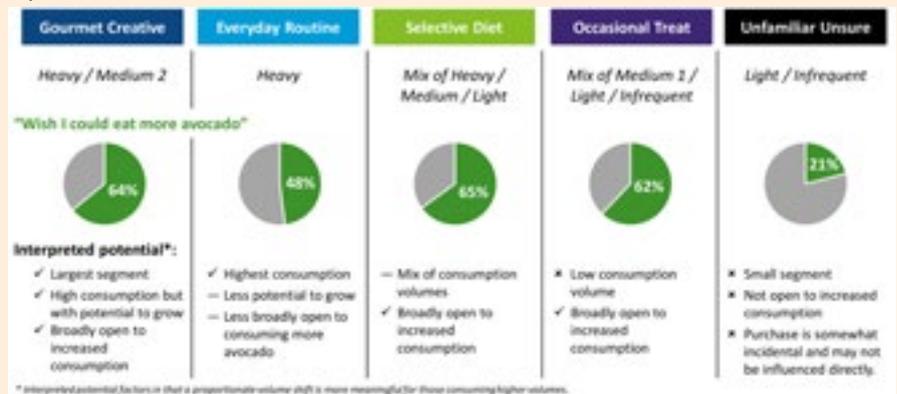


Figure 8. Segments ordered from highest to lowest potential. Source: Quantum Market Research report, 2017.

	27%	21%	21%	21%
	Gourmet Creative	Everyday Routine	Selective Diet	Occasional Treat
Overarching positioning	"Avocado is nourishing / wholesome and pure / unprocessed"			
Individual drivers	<p>Provide recipe inspiration</p> <ul style="list-style-type: none"> <li>→ Inspire new ways to use avocado - segment seeks inspiration from a range of sources.</li> <li>→ Educate about non-Hass varieties.</li> </ul>	<p>Facilitate increased bulk purchasing</p> <ul style="list-style-type: none"> <li>→ Educate on purchasing at different ripeness to provide week's supply - though more likely than others, only 60% of segment currently does this.</li> <li>→ Ensure retailers have a range of ripeness available to buy.</li> </ul>	<p>Appeal to health needs</p> <ul style="list-style-type: none"> <li>→ Address widespread (42%) fattening misconceptions.</li> <li>→ Reinforce perception of nutritional benefits.</li> <li>→ Inspire to eat as a snack food.</li> </ul>	<p>Price promotion</p> <ul style="list-style-type: none"> <li>→ Encourage to 'give in to temptation'.</li> </ul>

Figure 9. Drivers to unlock potential increase among target segments. Source: Quantum Market Research report, 2017.

# Caution urged when using drones



Farmers should be cautious of drone imagery being offered by rogue operators, researchers have warned.

A collaborative study by The University of Queensland and University of New England has shown “off-the-shelf” drone imagery products, sold to growers for up to \$4,000 per farm in some cases, are unlikely to provide accurate information about the health of crops.

Researcher Yu-Hsuan Tu, from the Joint Remote Sensing Research Program at UQ’s Remote Sensing Research Centre, said he could understand why farmers would be tempted to use drone technology for farm management.

“Drones can be deployed quickly to generate high resolution images attractive to growers seeking leaf-scale monitoring of their farms,” Mr Tu said.

“However, our research has shown that the high-tech, multi-spectral sensors used to collect images from the drone must be processed in a certain way to obtain correct information for horticultural farming applications.”

He said one of the biggest problems in the use of drones was related to inconsistencies in the way light is reflected off the surface of vegetation, depending on the height at which a drone is flown and its angle to the sun.

Such inconsistencies could result in farmers being given the wrong information about their crops if the data isn’t processed in the right way by experienced operators with remote sensing expertise.

“To compare reflectance across tree canopies, we flew a drone at different heights and angles to the sun above an avocado orchard, and found huge variations in the images collected,” he said.

“This means while differences in tree health might be

determined from tree to tree in imagery from one flyover, subsequent flyovers will show the vegetation very differently unless the drone is exactly the same height and angle to the sun - something almost impossible to achieve.

“In practice, this inconsistent imagery makes it impossible for farmers to compare vegetation conditions over time because the light variations are not corrected for height or angle and the product will be distorted.

“This could lead them to draw conclusions about the decline or improvement of their crops that may be incorrect – assumptions that could prove expensive to farmers already under pressure from recent weather events.”

Mr Tu has created an algorithm that corrects these variations in reflectance to ensure the delivery of consistent data for farmers.

He is now working to establish standardised protocols for the acquisition and processing of drone imagery for tree crops to assist commercial suppliers and growers.

Until then, he said farmers should undertake appropriate due diligence before spending substantial money on drone imagery for horticultural applications.

“While the science behind our work is complex, the message to farmers is simple: use drone technology at your risk – more work needs to be done before drone technology can accurately determine the health of crops,” he said.

## Acknowledgement

This PhD study is being supported by Hort Innovation through funding from the Australian Government Department of Agriculture and Water Resources as part of its Rural Research and Development for Profit project *Multi-scale monitoring tools for managing Australian Tree Crops: Industry meets innovation.*

# Snapshots

# International Avocado Research Update

This series of research snapshots is compiled from abstracts of published scientific papers accessed through CAB Direct as well as Google Scholar searches. Dates provided reflect the date research was published.

## Production

### Potential diagnostic tool to optimize tree nutrient status and increase yield

USA (2017): The goal of this research was to identify optimal nutrient concentrations in Hass which are predictive of yields greater than 40kg of fruit per tree. Nutrient concentrations of cauliflower stage inflorescences (CSI) proved better predictors of yield than other phenological stages. Concentrations of seven key nutrients were found to be predictive of trees producing greater than 40kg of fruit annually. Optimum nutrient concentration ranges were determined for each nutrient. Optimum ratios between nutrient concentrations and yields greater than 40kg per tree were also derived. The findings suggest current fertilisation practices (timing or amounts) in California might be limiting productivity, a possibility that warrants further investigation. Because CSI samples can be collected 4-6 weeks before full bloom, nutritional problems can be addressed before they affect flower retention and fruit set to increase current crop yield, fruit size, and quality. Hence CSI nutrient analysis may offer a potential supplemental or alternative tool for diagnosing 'Hass' avocado tree nutrient status and increasing yield.

### Effect of honey bee density on pollination and fruit set of Hass

Columbia (2018): Trials looking at different stocking rates of bee hives were carried out in orchards of 1 hectare with six-year-old Hass. The treatments were: 1) four hives/ha, 2) six hives/ha, and 3) control without hives. The results obtained show an increase of honeybee density per tree, pollination rate, pollination efficiency, percentage fruit set, percentage fruit set final, number of fruits per tree (231, 212 and 137 of fruits per tree respectively) and total fruit weight per tree (46.2, 38.2 and 21.6kg fruit per tree respectively) were achieved when six and four bee hives/ha are introduced into the crop.

### Storage of nurse seeds shown to have positive outcomes

Chile (2017): Larger seeds, such those of the Esther variety, are preferred as nurse seeds in avocado tree production. The aim of this study was to evaluate the combined effect of three storage periods and three sizes of Esther avocado seeds on vigour, seedling stem length and diameter. Small, medium and large seeds were stored for 10, 30 and 100 days at 5°C and 80% relative humidity. Seeds stored for longer showed the

greater loss of vigour but produced seedlings with a larger stem diameter (up to three times wider). It was shown that storage time had a positive effect on the growth of seedlings (length and diameter of the stem) regardless of the seed size. Loss of vigour in the seed did not correlate with subsequent seedling growth.

### Analysis of fatty acid content of seven avocado varieties

China (2017): As the basis for avocado breeding for quality and oil production, seven varieties of avocado, including Hass, were chosen to study the oil content and fatty acid composition in the pulp. There were significant differences between the varieties. One variety (RN-5) showed particular promise.

### Organic integrated pest management of tropical fruit crops

This chapter in the *Handbook of Pest Management in Organic Farming* (2018), reviews the tactics that could be used or are currently used for organic tropical fruit production. Key insect pests of four tropical-subtropical crops, ie avocado, mango, pawpaw and banana, are presented and the phases of the integrated pest management programs for their control are reviewed and discussed. The authors are affiliated with the University of Florida. Available from [www.cabi.org/cabebooks/ebook/20183008397](http://www.cabi.org/cabebooks/ebook/20183008397)

## Pests and diseases

### First Report of white root rot in avocados in South Africa

In September 2016, rapidly declining trees (grafted on *Phytophthora cinnamomi*-tolerant rootstocks) were observed in orchards in Tzaneen, South Africa. Subsequent investigation identified the pathogen causing this decline as white rot, *Rosellinia necatrix*.

### First report of ambrosia beetle and associated fusarium in London Plane trees in South Africa

South Africa (2018): During routine surveys of tree health in KwaZulu-Natal National Botanical Gardens undertaken as part of a sentinel project, an ambrosia beetle (polyphagous shot hole borer (PSHB))/fungal associate was detected damaging *Platanus x acerifolia* (London Plane). This is the first report of PSHB and its fungal symbiont causing Fusarium dieback in South Africa.

## First report of *Bionectria* species causing dieback in Columbia

Columbia (2018): *Bionectria pseudocholeuca* was identified as the agent causing dieback and wilting on avocado. *Bionectria* species associated with ambrosia beetles colonising avocado trees has been reported in California, USA. This is thought to be the first report of a *Bionectria* species causing dieback and wilting on avocado in Colombia.

## New fungus species identified as causing powdery mildew in Florida

USA (2018): A new *Erysiphe* sp. that caused powdery mildew on avocado was identified. It is thought to be the first report of an *Erysiphe* species causing in Florida, USA.

## Screening of a biological control bacterium to fight avocado diseases

Columbia (2018): A total of 667 native avocado bacterial isolates were screened for antagonistic activity and bioactive secondary metabolite production against avocado pathogens, *Phytophthora cinnamoni* and *Colletotrichum gloeosporioides*. One bacterium, *Serratia* sp., was identified as a promising candidate for the control of avocado pathogens in field and a good source of bioactive metabolites.

## Tracing the origin of Ambrosia beetle (USA)

USA (2017): Ambrosia beetle, *Euwallacea fornicates*, causes substantial damage to avocado. Members of this species have invaded many areas outside their native range, including three species that have invaded the USA: two species in California and a third species in both Florida and Hawaii. Identification of their native range allows directed search for their natural enemies that may be used in biological control of these tree pests.

## Potential for mass trapping of Ambrosia beetle (Israel)

Israel (2017): Ambrosia beetle (*Euwallacea* sp. near *fornicates*) is a pest of avocado in several countries including Israel and the United States. Simulations indicate mass trapping using quercivorol baits could be effective if begun in spring before competing sources of attraction are established.

## Post-harvest

### Temperature and ethylene effect on avocado quality

USA (2018): Avocados are often held for short periods after harvest at relatively high temperatures both in the field, in storage during preconditioning (ethylene ripening), or prior to ripening with unknown effects on subsequent quality. Results from trials over two seasons showed that even a 24-hour exposure to 25°C and above was sufficient to inhibit subsequent ripening and enhance the occurrence of postharvest disorders such as stem end rot and body rot. Fruit harvested over different periods and stored under different protocols were ripened to eating firmness at temperatures ranging from 15 to 25°C. Results showed increasing temperatures up to 20°C decreased ripening time, beyond which there was no further change. Avocados ripened at temperatures above 20°C had an increased incidence of the development of pink discoloration in the mesocarp. Ripening temperature had no effect on overall likeability, or ratings of grassy or rich flavor. The study strongly indicated the importance of maintaining the ripening temperature of avocados at or near 20°C both when the fruit is ripened soon after harvest or after storage to optimize postharvest quality.






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### Using thyme oil sachets to maintain quality of ready-to-eat avocados

South Africa (2018): After earlier promising results for the control of anthracnose in avocado fruit by thyme vapours, studies were extended to commercial use in tray packs. The effect of thyme oil low-density polyethylene impregnated pellets in sachets was investigated for the control of anthracnose and retention of dietary phytochemicals, fatty acid composition and fruit quality in ready-to-eat avocado fruit. The results showed positive outcomes and the study advocates the potential use of thyme oil sachets in commercial avocado trays.

### Modelling ethylene regulated Hass avocado quality

New Zealand (2018): This research has successfully built a mathematical model that will assist in predicting the effect of temperature, exogenous ethylene (ie ethylene derived from sources other than the fruit), and time on quality outcomes of Hass avocado. The modelling found that the effect of ethylene on softening was greater than on colour change.

### Extending shelf life of avocados using cold shock treatment

China (2017): Cold shock treatment (CST), which involved immersing fruit in ice water for 30 minutes, then subjecting it to natural or ethylene-induced ripening, was found to delay ripening-associated processes and could potentially be a useful postharvest technology to extend shelf life of avocado fruits.

### Roselle calyx extracts as an alternative control agent of foodborne diseases

Mexico (2017): The antibacterial effect of four roselle calyx extracts showed good effect on the reduction of concentration of 13 foodborne bacteria, including *Listeria*, *Salmonella* and *E. coli*, on whole avocados, when compared with other control agents.

### Using natural volatile compounds to maintain post-harvest quality

UK (2017): Methyl jasmonate (MeJA) and methyl salicylate (MeSA) has been shown to have the potential to reduce the susceptibility of Hass fruit to chilling injury when shipped at low temperatures (2°C for 21 days followed by 6-7 days of shelf-life

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at 20°C).

## Gellan gum-based coating used to extend avocado shelf life

Columbia (2017): Gellan gum is a naturally occurring gelling agent that is used in food production. The effect of an gellan gum-based edible coatings on post-harvest avocado quality of Hass fruit stored over nine weeks was assessed. The results indicated that that the coatings with the inclusion of low concentrations of glycerol reduced the loss of firmness, moisture, soluble solids and prevented large changes in pH, maintained the quality of avocado and extended its shelf life.

## Product

### Avocado seed extracts for control of parasitic worms in animals

Brazil (2018): Avocado seed were used as a source of polyphenols and were shown to have promise in controlling parasitic worms including Barber's pole worm. Barber's pole worm infects sheep, goats, horses and cattle and causes significant economic losses globally.

### Avocado honey

Ecuador (2018): Three types of monofloral honey from the Andean regions of Ecuador (avocado, eucalyptus, and rapeseed honey) were analysed to determine their floral origin, physicochemical parameters, chemical composition, antioxidant capacity, and their capacity to reduce in vitro bacterial biofilms. The highest values of bioactive compounds, as well as hydrogen peroxide content and anti-microbial activity were found in avocado honey.

### Avocado as a source of carbon for batteries

A three-dimension carbon derived from avocado has shown initial promise in improving the performance of lithium-ion batteries.

## Health

### Avocado consumption potentially increases cognitive function

USA (2017): Lutein levels in the macula and the brain are related to better cognition. Avocados are a bioavailable source of lutein. This study tests the effects of the intake of avocado on cognition. It was concluded that dietary recommendations including avocados may be an effective strategy for cognitive health.

## Quantifying anti-cancer compounds in avocado pulp

Canada (2018): Avocatin B, an avocado-derived compound mixture, was demonstrated recently to possess potent anticancer activity by selectively targeting and eliminating leukemia stem cells. Avocatin B is a mixture of avocadene and avocadyne, two compounds first discovered in avocado seeds; their quantities in avocado pulp are unknown. This research has successfully identified a method to quantify avocadene and avocadyne in lipid extracts of Hass avocado pulp and seed matter.

## Avocado oil – countering the negative impact of high fat meals

Brazil (2017): This research was to evaluate the impact of exchanging butter for Hass avocado-oil in the diets of 13 healthy overweight volunteers. The volunteers consumed a control meal consisting of: butter, eggs, bacon, wheat bread, potatoes and iced sugar, or a test meal, where butter was totally replaced by Hass avocado-oil. The study shows potential of Hass avocado-oil for counteracting the negative impact of a high fat and hypercaloric breakfast meal on important biomarkers related to cardiometabolic health.

## General

### Avocado production in Turkey

Turkey (2017): This study modelled avocado production in Turkey for 2016-2025. It was forecast that avocado production in Turkey will show increase from 2004 tons to 3156 tons for the 2016-2025 period.

### Big data to understand dietary trends and demand: Chinese avocado imports

China (2018): The advancement of data science and technology presents a unique opportunity to understand rapidly evolving dietary trend around the world. In this case study, it is shown that the Baidu index, a measurement of the intensity of user searches for specific words, helps explain and forecast the growth of avocado imports in China. Specifically, it was found that China's avocado imports rise by 8% in response to a 10% increase in the Baidu index.

## More information

If you would like more details on any of the snapshots, please contact Jenny Margetts, P2P Business Solutions, at [jmargetts@bigpond.com](mailto:jmargetts@bigpond.com) or 0418 215 276.

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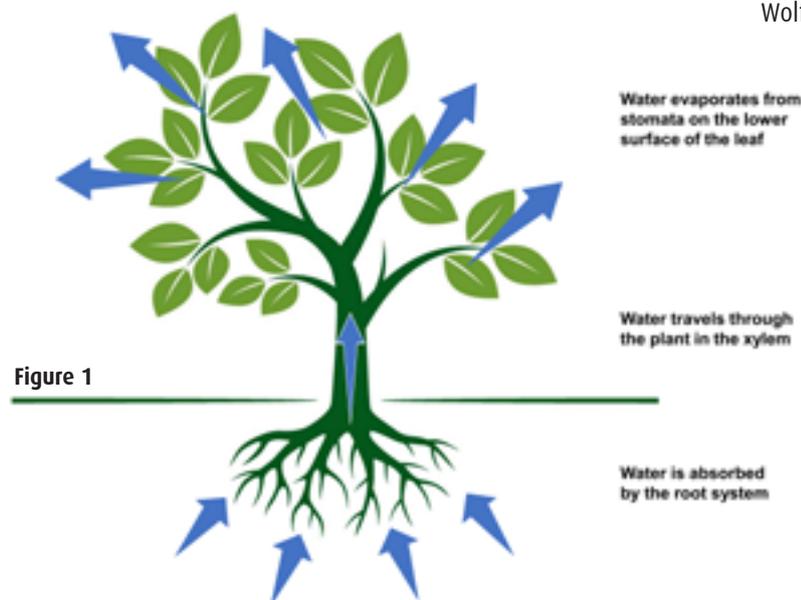
# Understanding tree water mechanics

Liz Singh & Shane Singh, AgriHort Solutions

Producing good yield and quality fruit is a constant battle against water availability and water use efficiency. Understanding the mechanics of water use in the orchard can provide the opportunity to manipulate irrigation timings and potentially the environment. Let's get a snapshot of tree water mechanics and the factors affecting it.

## Transpiration

Avocado trees absorb water from the soil through the roots which travels through the stems/trunk (xylem) to the leaves and evaporates from the leaves (stomata) in a process known as transpiration (Figure 1).

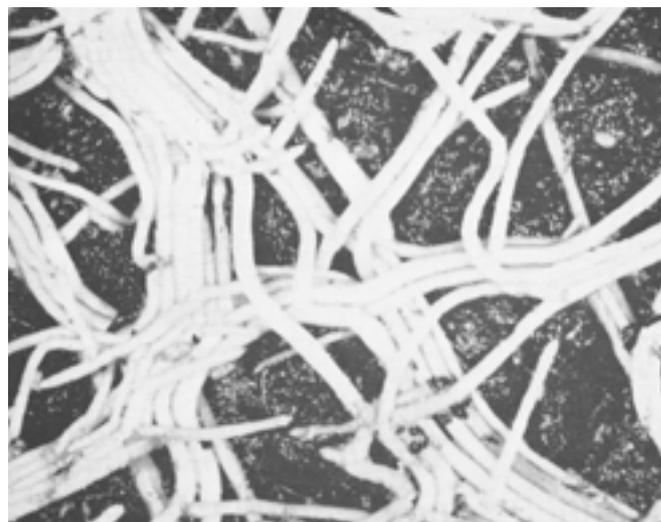


## Roots

Roots absorb water from the soil via osmosis, which is the movement of water from an area of high concentration (soil environment) across a permeable membrane (root) to an area of low concentration (tree).

An avocado root system consists of roots of various lengths/ages/health and generally has two root flushes per season; occurring at various times of the year depending on the growing region. (See the crop calendar for your region in the BPR Library at [avocado.org.au](http://avocado.org.au).)

In the same way the tree produces leaf flushes, trees will develop and grow new roots to replace aging/diseased roots and maintain optimal function. New roots are considered the most permeable to water uptake and in most plants are generally associated with root hairs that increase the root to



**Figure 2.** Avocado root tips growing in peat. Source: Burgis & Wolfe 1945.

soil surface contact improving access to water. However, in 1945 Burgis and Wolfe examined avocado roots under several different environments and found that avocado trees do not seem to develop root hairs (Figure 2). Further research has shown that avocados may indeed develop relationships with beneficial fungi in the soil to achieve the same result.

Root health is important in maintaining water uptake and transpiration. Root rot caused by *Phytophthora cinnamomi* presents the same symptoms

as water stress (reduced growth and wilting). Research conducted by Sterne *et al.* 1978 confirmed reduced water use efficiency in trees infected with *Phytophthora*, reporting decreased transpiration in comparison to healthy trees.

The distribution of avocado roots is important for accessing soil moisture and will be different for different varieties/rootstock/soil types and irrigation systems. Making a choice between sprinklers versus drip is a big question for growers, especially when installing irrigation in mature orchards located in traditionally rainfed environments. Salgado & Cautin 2008 examined avocado root distribution in fine and coarse textured soils under drip and sprinkler irrigation. They reported 25% more roots in the fine soil/drip irrigated treatment while root occurrence in the drip/course soil or under sprinklers regardless of soil type were all very similar.

In our opinion (AgriHort Solutions), if trees are grown in an arid

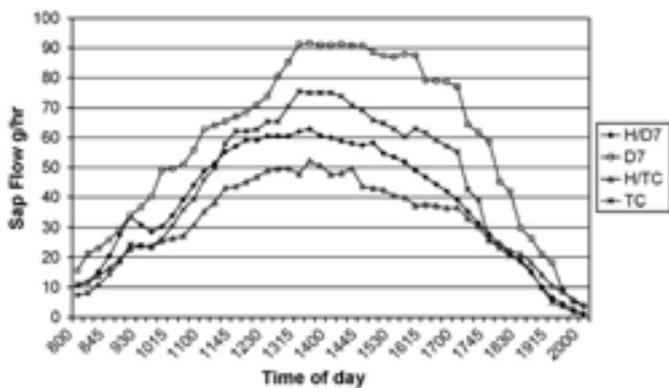
environment and are highly reliant on irrigation then a decision between drip and sprinklers can be discussed to considered, however, if you are only looking at supplementary irrigation during dry times of the year then sprinklers may be a better consideration because your goal is not to manipulate the current root distribution but rather feed it. Sprinklers can also be used to manipulate hot dry climates.

Salgado & Cautin 2008 also indicated that avocado tree roots were generally located within one metre of the trunk and within a 30-50cm soil depth. This is an important consideration when placing soil moisture monitoring devices. Other research and personal experience supports that avocado trees have a shallow root system and concentrate the bulk of roots in the top half a metre of soil. Limited soil moisture available to roots will impact transpiration flow and can negatively impact tree water balance and growth.

## Xylem

The water travels upwards from the roots to the leaves through the stems/trunk in a group of tubes called the xylem and is commonly referred to as sap flow. Selection of rootstock versus own roots can affect the water balance of a tree if the scion and rootstock are anatomically different, or basically the tubes between the rootstock and the scion don't match up. Fassio *et al.* 2009 showed on varieties not commonly grown in Australia (Duke 7/Toro Canyon) that sap flow was 40% higher in non-grafted versus Hass/grafted specimens. They also showed that there was a difference in sap flow rates between the varieties with Duke 7 (grafted/ungrafted) having a 29% higher sap flow rate than the Toro Canyon (grafted/ungrafted) - *Figure 3*. Higher sap flow could potentially mean higher water use/losses.

This physical impediment in the grafted specimens occurred due to the differences in rootstock and Hass anatomy. Examining vigour/sap flow characteristics may be a useful water saving selection criteria for future scion/rootstock matches.

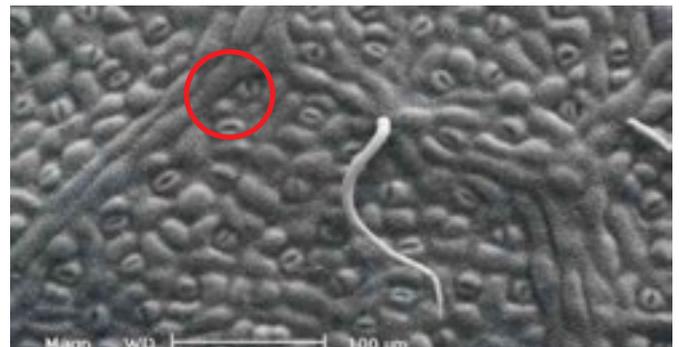


**Figure 3.** Sap flow of Hass grafted to Duke 7 (H/D7) and Toro Canyon (H/TC) versus ungrafted Duke 7 (D7) and Toro Canyon (TC). Source: Fassio *et al.* 2009.

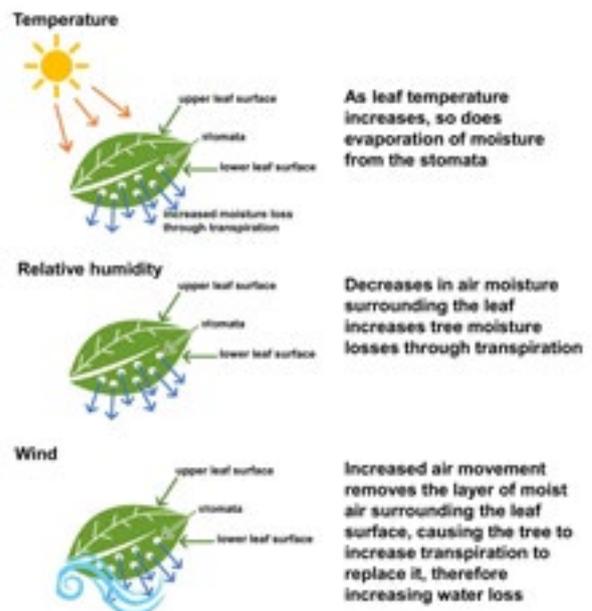
## Stomata

Water flows to the leaves where it is lost to the environment via evaporation through small pores on the lower side of the leaf called stomata (Figure 4). Stomates open and close in response to changes in the surrounding environment (Vapor Pressure Deficit) and the tree requirements. Factors that affect moisture loss through stomata include (1) increasing temperatures, (2) reduced relative humidity (3) windy weather (4) soil moisture availability.

Scholefield and Kriedemann 1979 showed that young leaf stomata were not completely operational until leaves reached 90% of their mature size. Given Hass leaves have been reported to take 30 days to reach mature size from bud break (Pongsomboon *et al.* 1997), trees may have a higher water requirement during periods of leaf flush to avoid wilting in the new growth and maintaining whole tree water balance. Interestingly Whaley *et al.* 1988 reported that floral structures



**Figure 4.** Stomata (circled example) on the lower surface of a mature Hass leaf. Source: Mickelbart & Apraia 2000



**Figure 5.** Water loss

## Understanding tree water mechanics continued

also have stomata and can contribute to significant water loss during flowering.

### Water conservation strategies

Different varieties demonstrate different strategies for minimising water loss during times of stress. In grapes, the terms pessimistic and optimistic have been used to describe certain variety strategies for dealing with water stress. The pessimistic varieties send signals to close the stomata at the first signs of stress thus conserving moisture and plant water balance. The optimistic varieties continue to transpire through open stomata optimistic that water availability will be just around the corner. This information is very valuable when allocating limited water resources in challenging times.

Kofidis et al. 2004 has revealed that avocados make physical adaptations in response to drought stress and there are differences between varieties. Both Hass and Fuerte were subjected to conditions of drought which resulted in physical changes including reduced leaf size, increased density of cells, increased number of oil cells to maintain leaf structure and in the case of Hass a slight though not significant increase in the number of stomata; all to better control the loss of water. Overall it was suggested that Hass had better strategies to survive drought stress in comparison to Fuerte.

### Summary

1. Understanding how water travels in the tree and the factors that affect it can assist in your water management.
2. Key factors affecting tree water use:
  - temperature
  - relative humidity
  - wind speed
  - soil moisture availability
  - root health & distribution
  - scion/rootstock combinations
  - variety water conservation strategies
  - growth stage.
3. Can you manipulate these factors? Yes, to some extent with irrigation. The use of sprinkler irrigation has been used successfully in arid growing environments such as the Tristate area to cool orchards and increase relative humidity. The presence of irrigation has proven results in manipulating soil moisture and thus crop growth and development.
4. Research is very useful for providing information that could assist you in improving production efficiencies. There is, however, a lot of research out there and not all of it will be relevant to your enterprise.

5. Make the research relevant to you. If you have found that some of the reported snippets of research in this article are interesting, put them into practice. For example, look up the crop calendar for your growing region, see when the root growth flushes are and during those times go out into your orchard and dig a hole. Have a look at the new root growth, see if there are root hairs. Maybe see if you can find a fungal association in your orchard, have it tested to make sure it is a beneficial species and if it is, investigate how to promote this relationship.

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# Technical focus at 2018 Irrigation Australia expo to help avocado growers

As growers are well aware, irrigation in avocado crops is crucial to get right. With trees being evergreen, most areas will need irrigation year-round, while accurate monitoring is necessary during the flowering, fruit-set and fruit-development stages to avoid problems due to the trees' sensitivity to moisture stress.

The 2018 Irrigation Australia International Conference and Exhibition will showcase the latest solutions, technologies and knowledge to help avocado growers.

The largest irrigation event in the southern hemisphere, the theme for this year's conference is "Addressing the Big Issues" and will look at five key topics: horticulture and agriculture, turf and landscape, key national areas, future planning and international matters, with a myriad of sub-topics under those. Rainwater harvesting and energy-efficient irrigation will be key interest points.

Irrigation Australia's CEO, Bryan Ward, said, "This is the only event in Australia that is solely dedicated to advancing and promoting the entire irrigation industry value chain, presenting issues both relating to and impacting on irrigation in this country. The event brings together the irrigation industry's full ambit, from researchers and scientists to manufacturers, retailers, installers, designers and end users.

"As well as the conference's five key topics, the entire event will highlight and showcase information and solutions around energy-efficient irrigation, the future, rainwater harvesting, technology, productivity, education, sustainability, and government and policy."

The conference will have more than 80 local and international speakers.

"Once again, we have an outstanding line-up of global leaders in their fields, stretching from research through to commerce, who will share their expertise on irrigation."

Alongside the conference, is a free exhibition and series of free-to-attend workshops.

"More than 165 exhibitors will showcase the latest in irrigation products and technology, while the workshops will cover a broad range of areas and are an excellent way for irrigators to keep themselves informed of issues."

Mr Ward urged all avocado growers to attend the 2018 Irrigation Australia International Conference and Exhibition to see, hear and learn the latest solutions, technologies and knowledge.

## Acknowledgement

Avocados Australia is a promotional partner for the 2018 Irrigation Australia International Conference and Exhibition.

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# Market recognition for fair employers a step closer

## Jane Muller, Growcom Fair Farms Initiative Project Manager

The Fair Farms Initiative fosters good employment practices across the Australian horticulture industry to ensure that workers are treated fairly while they are employed in fruit or vegetable farms and pack houses.

Now in its second year, the Initiative supports growers with the tools and knowledge to ensure their employment systems comply fully with workplace relations laws – and demonstrate this to customers and the wider community.

Fair Farms delivers grower workshops and seminars and informative articles for industry magazines. A market recognition scheme for fair employers is being developed and a national award to celebrate and showcase employment excellence in the industry is also planned, commencing in 2019.

To find out more, come along and see the Fair Farms team at the HortConnections trade show in Brisbane in June.

## Are you across your legal requirements as an employer?

Fair Farms seminars provide growers with a comprehensive overview of their legal requirements as employers and how to put this into practice in their farm business. Past participants have consistently rated the sessions as a 9 out of 10 or higher.

Horticulture workplace relations specialist, Donna Mogg, will be delivering four 'Getting Fair Work Compliant on farm' seminars in Western Australia between 21-25 May.

The 4-5 hour interactive sessions help grower-employers understand their legal obligations and level of compliance, and provide an opportunity to discuss specific risks and solutions. The seminars also look at practical ways to manage employment issues that commonly arise in fruit or vegetable businesses such as applying a robust induction process, encouraging workplace safety, ensuring fairness and equity in all staff dealings, and how to avoid unfair dismissal claims.

To find out more, contact Rebecca Myers at Growcom on 07 3620 3844 or [rmyers@growcom.com.au](mailto:rmyers@growcom.com.au).

## Industry stakeholders help shape Fair Farms market recognition scheme

The Fair Farms team is working closely with industry stakeholders to build a practical market recognition scheme for fair employers.

This will provide mechanism for fresh produce production and packing businesses to demonstrate to their customers that their employment practices are fair and comply with Australia's Fair Work laws.

The development of the scheme is timely. There is an increasing global public focus on ethical supply chains and 'modern slavery'. In Australia, there has been significant media coverage of underpayment, exploitation or mistreatment of workers on farms and food packing or processing facilities. Social media also provides a forum for current and past farm workers to share their experiences.

Australian retailers have responded by adopting responsible or ethical sourcing policies and are considering how these will be implemented with their fresh produce suppliers.

We are liaising with Coles, Woolworths and ALDI to ensure the proposed Fair Farms market recognition scheme clearly aligns with their requirements, and these retailers have indicated their willingness to collaborate with industry towards the development and piloting of the scheme.

Currently, the Code of Practice for the scheme is being finalised. Growcom's Hort360 Workplace Relations module, which addresses Australia's Fair Work laws and relevant Awards, provides the foundation for the Code. Further elements to address priority matters identified within retailers' policy statements will also be included.

Mechanisms for verifying on-farm practices are also being developed. The scheme will incorporate self-assessment options through to independent verification and certification through Freshcare. Businesses can select the option that best suits their own needs and the requirements of their customers.

The entry stage of the scheme is an on-line self-assessment of the business' workplace relations practices, generating a report of the business' level of compliance with the Code. If the report recommends further training, options will include individual business consultation, group training, or customised sessions for growers who work with major suppliers. Training will be delivered through Growcom and a network of approved trainers.

The scheme will be piloted with a number of farm businesses from July to ensure it delivers fairness for workers, assurance to customers and the community, and a practical process for growers.

## More information

For further information, contact: Jane Muller, Fair Farms Initiative Project Manager, Growcom: [jmuller@growcom.com.au](mailto:jmuller@growcom.com.au) or 07 3620 3891.

# Queensland introduces mandatory labour hire licensing

The Queensland Government has established a mandatory labour hire licensing scheme to protect workers from exploitation and promote the integrity of the labour hire industry in the state.

The scheme requires labour hire providers to be licensed and users of labour hire to use only licensed providers.

To obtain a licence, a labour hire provider must demonstrate that they are fit and proper to provide labour hire services, can comply with relevant State and Commonwealth laws and that the labour hire business is financially viable.

Applications for a Queensland labour hire provider licence can be made online at [labourhire.qld.gov.au](http://labourhire.qld.gov.au). Existing labour hire providers have until 15 June 2018 to apply, and can continue to operate while their application is being considered provided they applied before 15 June 2018.

## More information

Once registered, licensed labour hire providers will be listed on a public register at [labourhire.qld.gov.au](http://labourhire.qld.gov.au). Users of labour hire can search the register or check if a labour hire provider has made an application by viewing the pending applications list.



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# Penalties for exploiting vulnerable workers significantly increased

*Jane Muller, Growcom Fair Farms Initiative Project Manager*

The Fair Work Act was amended in September 2017 to incorporate specific measures to protect vulnerable workers. The Fair Work Ombudsman’s evidence-gathering powers have been strengthened and other changes include:

- penalties for providing Fair Work inspectors with false or misleading information or records have tripled and new prohibitions for hindering or obstructing inspectors have been introduced
- maximum penalties for record-keeping and pay slip breaches have doubled to \$12,600 per contravention for individuals and \$63,000 for companies. The maximum penalty for false or misleading employment records has tripled

- employers who do not meet record keeping or pay slip obligations and cannot show a reasonable excuse, will need to disprove wage claims made in a court
- the prohibitions against unreasonably requiring employees to make payments, so-called ‘cashback’ arrangements, have been strengthened and extended to prospective employees
- certain franchisors and holding companies are now responsible for underpayments by their franchisees or subsidiaries where they knew, or reasonably ought to have known, about the contraventions and failed to take reasonable steps to prevent them.

A new category of serious contraventions has been introduced. Penalties are now 10 times higher where employers knowingly contravene the law and their actions are part of a systematic pattern of contravening conduct. In such cases, maximum penalties of \$630,000 and \$126,000 per contravention could apply to corporations and individuals respectively.



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- Established food service market
- Fresh exporter
- Avocado Export Company (AEC) has established export markets in Singapore, United Arab Emirates and Malaysia



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# Global research partnership with UC Davis

The grower-owned Research and Development Corporation, Hort Innovation, has signed a historic co-operative research deal with a leading US research university, ranked among the top in the world for agricultural science programs, to support Australia's \$9.3 billion horticulture industry.

The agreement was finalised after Hort Innovation and the University of California, Davis, signed a Memorandum of Understanding (MoU) in late April. Both parties have entered into a two-year research and information sharing agreement.

Hort Innovation CEO John Lloyd said the University's College of Agricultural and Environmental Sciences had an international research reputation with celebrated academics and a wealth of growing, transferable knowledge that applied to key issues in Australian horticulture.

"With a research investment spend of more than \$780 million per year, a faculty that is stacked with academic award-winners, and a wealth of other accolades for research excellence, UC Davis is the ideal institution with which to partner," he said.

"In return, UC Davis will get the opportunity to work with leading Australian research providers through Hort Innovation to build on its knowledge and share resources to tackle some of the biggest issues our countries face in modern agriculture."

Mr Lloyd said the specific research priorities of the agreement are being discussed, and it is likely key areas of focus will include smart farming, pollination, food science and a PHD exchange student program.

"This agreement will allow us to combine some of North America's leading research minds with those of some of Australia's top researchers to provide benefits to Australian horticulture for years to come."



*David Moore, general manager of research, marketing and investments at Hort Innovation, and Bryan Jenkins, distinguished professor and chair for the department of Biological and Agricultural Engineering in the College of Agricultural and Environmental Sciences at UC Davis. IMAGE: Tene Goodwin/UC Davis.*

UC Davis vice provost and associate chancellor of global affairs Joanna Regulska said the collaboration with Hort Innovation provided a unique opportunity for research and innovation.

"It is only through these strong cross-border and interdisciplinary collaborations that global challenges can be solved."

Hort Innovation, industry representatives, the Australian Government and UC Davis are scoping the research strategy with details expected to be released in the coming weeks.

Mr Lloyd said Hort Innovation would be calling for Expressions of Interest from potential research partners and co-investors in the coming months.



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# Global adventure to inspire farming's change-makers

A new campaign to unearth the best and brightest talent in Australian agriculture has been launched by Nuffield Australia, aimed at encouraging primary producers from around the nation to put their name forward for a 2019 Nuffield Scholarship.

*Produce Change* is designed to get Australia's agricultural community excited about the Nuffield Scholarship program, and to encourage 28-45-year-old farmers and farm managers to apply for the unique experience. The application period closes on 15 June 2018.

Nuffield Australia CEO Jodie Dean said the theme was inspired and encouraged by both the successes of existing Scholars and the next wave of farmers, who were redefining agriculture in an age of unprecedented technological advances and globalisation.

"Producing change goes straight to the heart of what we do at Nuffield. Nuffield Scholars research and deliver practical change that adds real value to farm businesses and the Australian community more broadly," Ms. Dean said.

"Our scholarships push farmers to take the next leap in their career, whether that be an end goal of farm expansion, diversification or professional development – the scholarships are a key to unlock change. This year, there are up to 25 scholarships on offer, each valued at \$30,000.

"Each scholarship runs for 18 months and enables farmers to travel overseas for 16 weeks, to discover and learn from some of the best operators in the business, who are making a meaningful impact on their industry, and to share those learnings back home."

Avocados Australia Director Dudley Mitchell started his Nuffield Scholarship this year. He will be looking at avocado industries in Chile, North America, Israel, New Zealand and South Africa as part of the scholarship, investigating current trends in canopy management and how cultural practices will need to be addressed when considering high density plantings.

For more information, or to apply, visit: <http://nuffield.com.au/>

## 30 June deadline for HARPS

Tier 2 suppliers that may require HARPS approval will have until 1 January 2019, however, these businesses should register their interest in achieving HARPS approval by 30 June 2018.

The Harmonised Australian Retailer Produce Scheme (HARPS) is a retailer-led scheme designed to assist with compliance to food safety, legal and trade requirements for suppliers to the major grocery retailers in Australia.

HARPS has combined the individual requirements of each of the major grocery retailers in Australia into a single scheme. Now producers must be audited to a Base Scheme (Freshcare Food Safety & Quality; SQF; BRC Global Standard for Food Safety; GLOBALG.A.P. Integrated Farm Assurance) plus the HARPS requirements to become HARPS approved. This is best conducted as an integrated single audit. HARPS only applies to whole fruit, whole vegetables and nuts in shell (not processing).

The five major retailers that have developed and recognise HARPS are ALDI, Coles, Costco, Metcash (IGA) and Woolworths.

### Tier 2

If you intend or believe your product may be supplied to one or more HARPS participating retailers, then you may require HARPS. In the first instance, contact your wholesaler/market agent or Tier 1 customer that you supply your product to and confirm your supply arrangement. For example, are you on their Approved Supplier Program for a HARPS Participating Retailer or do you pack or re-pack product destined for a HARPS Participating Retailer?

You can also determine if you are a Tier 2 supplier by assessing the activities completed by your business. Generally, if you are packing or re-packing product, or conduct any of the following activities, then you are a Tier 2 supplier:

- you apply PLU and/or DataBar stickers to loose product as specified by a HARPS participating Retailer
- you pack or re-pack retail-branded prepacks
- you pack or re-pack into Returnable Plastic Crates (RPCs)
- you pack or re-pack proprietary branded pre-packs
- you pack or re-pack loose product in final retail packaging, packed to a retail specification
- your business is part of an Approved Supplier Program for your Tier 1 customer; and/or
- your business provides Ancillary Services (supporting or additional services including ripening, brokerage activities, storage and cooling where product handling and traceability are the responsibility of the Ancillary Service supplier).

HARPS as a new factsheet for Tier 2 suppliers here: <https://go.gl/hSxiET>. If you are unsure of your status or would like to discuss your specific circumstances, please call the HARPS Helpline on 1300 852 219 or visit <https://harpsonline.com.au/>

# News from Around the World

*News from Around the World contains reproduced articles that have been published by various international news sources.*

## South Africa chasing Asian avocado markets

South Africa commits 40% of its avocado production to the domestic fresh fruit market, 10% to processed products including guacamole and oil but it's looking for expanded homes for the 50% it exports.

South African Avocado Growers Association CEO Derek Donkin recently told *fruitnet.com* the industry was "gearing up to keep pace with commercial avocado plantings".

According to SAAGA's website, South Africa has 17,500ha planted to avocados, with 1000ha of new plantings annually.

SAAGA told *fruitnet.com* it was now working with the South African government to "gain access to markets in new territories, including the US, China, Japan, India, Thailand, South Korea, Israel, Vietnam and Mexico".

[www.fruitnet.com/eurofruit/article/175347/south-african-avo-market-on-the-up](http://www.fruitnet.com/eurofruit/article/175347/south-african-avo-market-on-the-up)

## New Zealand looking to Korea

In 2017-18, Korea became the most important avocado market for New Zealand by volume and value outside of Australia.

Writing in the company newsletter, Avoca market manager for Korea Martin Napper said Korea imported 1.1 million trays – more than double the volume imported from all origins in 2016.

"The fruit carried a value of US\$31 million – up 158% on the previous year's value," he said.

AVANZA (a New Zealand Asian market specialist) exported 96,000 trays to Korea, down from 134,000 trays in 2016-17 due to the shorter crop.

"This represents 9% of all avocado imports and 66% of all New Zealand fruit shipped to Korea," Napper said.

"Despite the lighter volume, sales of \$3.3 million were only 15% less than in 2016 due to a higher market return per tray (NZ\$34.76 vs \$29.28 tray equivalent).

"AVANZA's four years of promotional activity, coordinated by our in-market agency Latitude, has created real growth in this category by educating consumers, retailers and importers about avocado consumption, handling, storage and ripening."



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Napper said last year's promotional activity included an ongoing association with Maeil Dairies, one of the largest beverage companies in Korea. This partnership with Maeil enabled AVANZA to participate in their well-organised online soy milk and avocado promotions which included far-reaching social media campaigns highlighting the nutritional benefits of avocados. This activity generates encouraging engagement with young, health-conscious Korean women.

"Supermarket demonstrations continue to be an effective way to reach first-time consumers and educate them with recipe ideas and handling advice. Last year, we held 250 in-store demonstrations, targeting 100,000 consumers. Over the past four years, AVANZA has now held a total of 1500 sampling sessions, reaching 600,000 consumers," he said.

"Permanent ripening displays have been installed in selected stores, providing consumers with the option to select a ready-to-eat piece of fruit – a strategy that has been proven to increase sales by over 300%. This also provides evidence to our distribution and retail partners of the importance of ripening and offering loose avocados."

Napper says awareness about avocados has been elevated due to ongoing market investment and the coverage given to the fruit on cooking shows and health programmes screened in Korea and this has caused many new consumers to actively look for the fruit.

"The trendiness of the product can account for a level of consumption but it's the fruit's health attributes that appear to drive consistent purchase," he said.

"Consumer trends have also bolstered retailers' appreciation for this produce category. The avocado was a largely ignored three years ago but it's now become a centrepiece for displays and stands in many Korean stores. E-mart, which accounts for 30% of Korea's total retail turnover, leads the way in this area. Last year, the retail chain returned to 100% New Zealand fruit after a poor experience with avocados sourced from Mexico. Our AVANZA fruit was stocked exclusively from September to early January then replaced by Californian avocados from Mission Produce."

Napper said the demand was out-stripping the ability of New Zealand to supply enough fruit to cover all the retail channels, forcing some retailers to source their fruit from Mexico to fill the gaps.

[www.avoco.co.nz/vdb/document/172](http://www.avoco.co.nz/vdb/document/172)



## Grower Member Application Form

### Avocados Australia Limited

ACN 105 853 807

The Australian avocado industry is a growing, successful and progressive industry. As the Australian avocado industry's peak industry body we work closely with all of the stakeholders that can have a direct impact on the marketplace. If you are looking to gain the maximum benefit from being a part of the Australian avocado industry we recommend that you become a member of Avocados Australia.

Avocados Australia provides online and offline information, programs, materials and events to advance the industry. On top of this there are other services we can provide that are only made possible through the support of our members. Join today. All membership enquiries can be directed to [admin@avocado.org.au](mailto:admin@avocado.org.au) or call toll free 1300 303 971.

For Associate and Affiliate membership application forms please go to: [www.avocado.org.au](http://www.avocado.org.au) or call 07 3846 6566

### Member Details

Business name  
and/or trading name:

ABN:

Key contacts:

Preferred address  
(postal):

Address of property  
(if different):

### Contact Details

Business phone:

Home phone:

Fax:

Mobile:

Grower Member Application Form continued

Email: \_\_\_\_\_

**Corporate Structure**

How would you describe the nature of your operations (please tick)?

- Individual     Partnership     Company  
 Trust     Lessee     Cooperative  
 Other (please specify)

Please indicate the area of property that you crop for avocados (please tick)

- 0.5 - 5 ha     6-19 ha     20-49 ha  
 50-99 ha     100-149 ha     150-199 ha  
 200-499 ha     500 ha+

**Payment Options**

Grower Membership of Avocados Australia is \$250 pa (+ GST).

You can pay your membership by cheque or credit card. To pay your membership fee, please choose one of the following options:

- Cheque**  
 Please find enclosed a cheque for \$275.00 made payable to Avocados Australia Ltd.
- Credit Card**  
 Please charge \$250 (+GST) to my credit card.  
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Credit card type (please circle):                      Mastercard      Visa

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Name on credit card: \_\_\_\_\_

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Signature: \_\_\_\_\_

Once you have completed this form please place it in an envelope addressed to:

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News from Around the World continued

**Mexico targets Asia**

For Mexico’s producers and packers, the Asian market represents a very valuable opportunity.

According to APEAM (the Association of Producers, Packers and Exporters of Avocado from Mexico), since in the 2016-2017 season more than 100 thousand tons of Mexican avocado were sent to the Pacific and Middle East, with more than 50 thousand tons also sent to the countries of the Asia -Pacific (Japan, China, Singapore, among others).

“Do not forget that China, our second market in Asia and the fifth in the world, presents a lot of potential, given the increase in interest in the beneficial properties of our avocado,” APEAM said in a March release.

“That is why it has been reviewed, together with a communication and marketing agency specialising in food, drink and lifestyle, a possible promotion campaign in the Asian giant.”

According to APEAM, its efforts in China have focused on training the country’s importers to handle avocados.

“Thus, last year, during the SIAL, the largest food innovation fair in Asia, at the seminar ‘Aguacate Mexicano’, showed the benefits of our fruit, how it is traded, how it is harvested and how it is handled in places of origin and destination.”

Last year, during the SIAL, a food innovation fair in Asia, APEAM conducted a seminar on Mexican avocado, explaining the fruit’s health benefits, how it is traded, how it is harvested, and the importance of its proper handling in the places of origin and destination.

In a Fresh Plaza article in April, it was reported APEAM launched through its Avocados From Mexico (AFM) brand the first two official accounts on Weibo and WeChat, the most important social networking and personal messaging platforms in China.

“In China, the younger generations who live in cities and have a better standard of living have enthusiastically adopted the avocado in their diet. In addition, 75% of the consumers of Mexican avocado in that country are women, due to the nutritional properties and benefits that this fruit has for the skin,” the Fresh Plaza article said.

And this year, APEAM has been present at Foodex Japan

“All of APEAM’s activities abroad, such as our participation in this first-level fair in Asia, contribute to the increase in consumption of Mexican avocados and, therefore, directly benefit all members of the value chain,” APEAM said.

Read more here: <https://goo.gl/Gw2ZtY>.

## Chinese market growing for avocado

Avocados appeared on the plates of more Chinese people last year, *FreshPlaza* has reported.

According to the online news service, this demand for avocados has been encouraged the growth of Chinese import of avocados from Mexico.

"Data from the Mexican Ministry of Economic Affairs shows that Mexico exported 8.75 million kilograms of avocados to China in 2017," *FreshPlaza* reported, with an export value that increased 6% on 2016, as China has become Mexico's eighth largest avocado export destination.

According to the *Produce Report*, China imported 32,100 tons of avocado in 2017, up from just 31.8 tons in 2011.

"Despite some signs of slowing down, China's avocado imports still grew 28% year-on-year in 2017, with the import value hitting an all-time high of 105 million dollars," according to *Produce Report*.

The Chinese market is currently served by China, Peru and

Chile. Latecomer Chile, while only gaining access to the Chinese market in 2014, has been China's largest supplier in the past two years.

"In 2017, Chile's avocado exports to China totalled 16,700 tons, an increase of 44% versus 2016. Factors such as a long season, consistency of quality, and better tariff rates led the nation to garner the top position," *Produce Partner* reported.

However, *Produce Partner* noted more competition was on the way, including from New Zealand, which dispatched its first trial shipment in February this year, ahead of the 2018/19 season.

"It was reported that talks on entry to China are also underway for avocados from the US, Columbia, Israel, Myanmar, and the Philippines," according to *Produce Report*.

Added to this, China is also developing its own domestic avocado industry. The first commercial domestic harvest occurred in south-western China's Yunnan province in late 2017.

[www.freshplaza.com/article/192430/Mexican-avocado-exports-to-China-increased-by-6-percent-in-2017](http://www.freshplaza.com/article/192430/Mexican-avocado-exports-to-China-increased-by-6-percent-in-2017)

[www.producereport.com/article/2017-year-review-china-s-avocado-market](http://www.producereport.com/article/2017-year-review-china-s-avocado-market)








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