

TALKING AVOCADOS



Avocado industry worth \$557 million

**Australia now has
more than two million avocado trees**

Taste Australia's Hong Kong success

Asia Fruit Logistica

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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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Chairman's Perspective

At this time of year my thoughts usually turn to weather patterns and flowering success or otherwise, and so it is basically about matters that neither I or you have any control of. So, why bother about such matters when there are other matters that we do have control of that we can look to having a robust discussion about?

Let's talk about what has made our industry stand out from others in the Australian, and also in the world, environment.

The first thing I can identify is our industry's ability to measure our growth, meaning that we have for many years now monitored tree numbers by variety and age and region and we have the information to extrapolate production forecasts into the future. I refer, of course, to *OrchardInfo*.

Secondly, we have the ability to monitor annual production forecasts and actual product dispatches by region so we all can understand the dynamics of our industry. Our advantage is that trees are in for the long-term so we can easily calculate for the future.

Thirdly, our *Infocado* programme can record and monitor weekly forecasts and actual dispatch volumes by variety, pack size, terminal market, and channel of despatch to the markets and this, more than anything will give growers and their participating consolidators the information to better understand the market dynamics. In the case of *Infocado*, the system relies on participants providing the information accurately and on time and only those who participate get the information. In every case the packhouse identity is protected and where less than three packhouses or consolidators/wholesalers submit data then no names are published on the contributor list to offer more privacy. Some entities may not appear on the contributor list because their supply may be entered by another party on their behalf.

These systems are highly valued by industry but we have some who feel reluctant to participate. It could be seen as an infringement on private information or it could be seen to be information that can be used contrary to the benefit of growers by other parties. These are valid concerns, and both have been discussed at length during the development of *Infocado* and subsequent reviews.

My experience on this is that the market has had, in the past, its own gossip trail of information and because there was no actual verifiable source of information the story could be manipulated.

How was I, or you, to know what was true? All we knew for sure was that it was going to hurt. Enter *Infocado*, and we now have a benchmark of supply data on a weekly basis and the forecast going out four weeks and we can understand what is likely to happen in the market and for what reason it happens. Some growers argue that the data is not exact and, in reality, it may never be, but it is accurate enough to be able to give trends that we can understand.

Like any computer system, accurate data in means accurate data out and we all know and understand the reverse of this statement.

So, to make this work for us we need to have everyone on the team working to the best of their ability and to provide accurate and timely data, every week and every quarter for *Infocado*, and annually for *OrchardInfo* data collection.

Working together, as a team, with an aim to keep gathering the information our industry needs to plan ahead and to protect our interests on a weekly basis depends on that commitment to cooperate with accurate data.

This data collection is not something peculiar to Australian avocados. The global avocado trading countries contribute weekly supply information for the EU market and some 16 countries make up the Avocado Marketing and Promotion (AMAP) group, 11 of these are major exporters to the EU and account for 2,740,430 metric tonnes of avocado. Australia is a member of this group and we get their reports and we will submit our relevant data on exports when required. We are part of the global avocado team.

My initial thoughts about growers having reservations about this subject went to the performance of the Australian Womens 8's (rowing team) in the Athens Olympics Games, 2008. That team was set to continue their winning streak but on their most important day, the final race, one of the team hesitated (stopped rowing) and did not support the team effort. The rest is history, with a bad result, and no recovery for that team. What future do you want for your team?

Jim Kochi

Jim Kochi, Chairman, Avocados Australia Limited



CEO's Report

Austrade briefing

During Asia Fruit Logistica 2018 in Hong Kong, our Communications Manager, Lisa Yorkston, was given the opportunity to brief Austrade representatives from across the region about the Australian avocado industry.

Organised by Hort Innovation, Avocados Australia was able to brief the various Austrade business development managers on current trade capacity, industry priorities and future production expectations.

In particular, Avocados Australia viewed this as an opportunity to stress the importance of growing our markets alongside our growing domestic production capacity.

You can read more about Asia Fruit Logistica, the Asiafruit Congress and our new resources for our Global customers on pages 15-26.



Industry state of play

It will come as no surprise to anyone to hear that we have revised upward our expected production by 2025. About one-third of the two million trees currently in the ground are yet to either start producing or reach full production capacity.

We're looking at expanded plantings in all of our production regions, particularly North Queensland and Western Australia. While it seems planting has plateaued in other regions for the moment (page 14 for more from the latest *OrchardInfo*) report, we're now expecting to produce about 115,000 tonnes a year by 2025.

As you will read in the latest *Facts at a Glance* (pages 11-13), our production in 2017/18 was 17% more than the previous year, with a gross value of production estimated at \$557 million.

Long-term, the industry is working to increase domestic consumption above the current 3.5kg/person, expand our current export markets and gain access to new ones. This, along with a focus on quality, will be the keys to our long-term success.

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.

To apply for a PRN visit www.avocado.org.au or call **07 3846 6566**.



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Avocado industry prepared

No one could have missed the recent crises in relation to strawberry (and other fruit) contamination and the melon listeria incidents. Avocados Australia has an avocado industry crisis management plan to provide a structured approach to dealing with most potential crises the industry may experience.

The plan was developed a couple of years ago in conjunction with Control Risks, leaders in this field, who have extensive experience in the food and agricultural sector.

A "crisis" in this case is defined as an emerging or actual event which has the potential to severely impact the industry, whether it affects growers, consumers, supply chain, or industry assets, operation or reputation. For example, this could be a major weather event in one of our grower regions, a food safety breach, environmental contamination or major changes to market conditions.

The core members of the team are myself, Communications Manager Lisa Yorkston and Administration and Finance Manager Jayne Weedon. Depending on the nature of the crisis, Avocados Australia will also work closely with board directors across the main production regions.

As part of the plan, Avocados Australia has a protocol around its actions according to the crisis so please make the Avocados Australia office your first point of call: 07 3846 6566.

In particular, if you receive calls from any reporters during an industry crisis, or on any issue which you think might become an industry crisis, then we encourage you to refer them directly to the Avocados Australia office. That way we can assist in managing the crisis in the best interests of the industry and ensure appropriate and consistent messages through the media.

Staff changes

Our Data Analyst, Sue Plunkett-Cole has moved on to a new role, and we are now in the process of appointing a replacement to carry the *Avocado industry and market data capture and analysis* (AV16006) project forward. During her time with Avocados Australia, Sue worked to verify our existing data, improve data collection methods and importantly, improve Infocado and *OrchardInfo* for growers, as well as our annual *Facts at a Glance*. You can see the results of her work throughout this edition of *Talking Avocados* on pages 11-14.

John Tyas

John Tyas, CEO, Avocados Australia Limited

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Around Australia

Central New South Wales Report

By Ian Tolson, Avocados Australia Director



The abundance of fruit in the market place throughout the season is a stark, brutal reality check for the industry. Prices have been significantly below those of the previous few years. It is quite possible these prices or lower will be what growers will have to become accustomed to. Continued plantings across growing areas will see an increase in production for many years to come.

Now is probably the time to consider how and what changes are needed to orchard management to achieve the best possible returns for harvested fruit. Fruit quality is the major consideration. There are several aspects to 'Premium' fruit: external and internal quality and shelf life. All these are controllable within the orchard.

Consumption must remain at least in line with, or preferably above, the future growth in production. Striving to supply the best quality product to consumers, is not only taking control of your own destiny, it will go a long way to safeguarding consumption growth.

Harvest in the Stuarts Point and Bellingen areas is almost finished at the time of writing (mid October). Comboyne and Mangrove Mountain harvests are in stages. Overall, the harvest for this region will be a marked increase on previous years.

The calendar tells us it is Spring, however, daytime temperatures are struggling to reach mid 20s and the nights are still quite cool. A few welcome showers mid-September lifted the spirits of local farmers who were struggling to keep their orchards watered.

Good flowering throughout orchards once again, of course the challenge is to convert flowering to fruit set. Hopefully all areas will avoid the dreaded hail storms.

A big thank you to those responsible for the wonderful promotional effort of our industry during the Yarrahappini/Stuarts Point Festival. Friday night's gala opening saw patrons consuming bowls of delicious guacamole, then on Saturday the



Good crowds attended the recent Yarrahappini/Stuarts Point Festival, where the avocado tent was a popular stopping point.

'avocado' tent was well attended, festival goers eager to learn more about the region's industry and avocado varieties. Children from Stuarts Point Public and one class from Macksville Primary were involved in a very unique competition, where they had to dress/decorate an avocado. One boy was so dedicated to the task he even named his avocado "Hector" and wrote a rather cute little story to accompany his entry. Judges were very impressed with the entries and the children's efforts. Thank you also to Avocados Australia for the promotional material.



A competition for the most creatively "dressed" avocado was popular with local school students at the Yarrahappini/Stuarts Point Festival.

Western Australia Report

By Dudley Mitchell, Avocados Australia Director



Western Australia launched its season into a fairly congested market as fruit from all states had a presence in most supply chains. In spite of this, prices crept up until Week 38 when unexpected extra volume from New Zealand and the southern coastal regions of Western Australia pushed volumes to record highs. As a result, and in order to move fruit, prices reduced but have since stabilised at fairly good levels, albeit lower than the same time last year. It is really important now for the growers in the southern areas to manage their picking programs with an eye on the forecasts in *Infocado* and to be in constant communication with the markets.

It will be another good year if growers can be disciplined and ensure that their fruit gets to market in the best possible condition. New Zealand fruit may impact prices this year as they have a bigger crop and there seems to be delays in getting their fruit through quarantine resulting in poorer quality product entering the market, another reason why the chains should be buying local as far as possible.

Weatherwise, the Bureau of Meteorology has predicted a warmer and drier spring than normal and as I write there seems to be an early pollination event happening. This may bode well for next year's crop so long as there are no unexpected cold snaps in between. On that note I wish all the Western Australian growers the best for the coming season and as always please feel free to contact me if you have any questions.

Tristate Report

By Kym Thiel, Avocados Australia Director

The big dry continues in most parts of the country including the Tristate. Although we are dependant on irrigation from the River Murray, rain is always welcome especially in the catchment areas to ensure 100% irrigation allocations are received.



With a light crop hanging, harvest began in early September for a lot of growers and for a short period returns were excellent, and demand was great for all sizes and grades of fruit. With the onset of New Zealand fruit and some big volumes from the west this was short lived and returns and demand both quickly subsided with the mountain of fruit on offer. This is the first time for a numbers of seasons where the market has been severely affected by over supply. With growers having such small volumes available this season, exporting was not an option for most, however, moving into the future, and if the current flowering is anything to go by, volumes will quickly rebound and we must look at all markets and seriously consider moving more fruit offshore.

As growers we are always optimistic that we will find more fruit than we have estimated when things are light, but this hasn't been the case with it being just as bad as predicted which is half of last year's crop. To make up for this, fruit quality has been up and as is to be expected in a light crop, size is up as well. However, in some cases it has been well above the preferred supermarket sizes.

Having got through the Winter without too much frost our

attention has now turned to the current setting conditions and flowering. Flowering is strong and bee numbers appear to be up. Temperatures have been all over the place with some mornings and nights getting down to 2-3 degrees whilst others have hovered in the teens. Barring any major natural disaster or climate influences, the Tristate should rebound next year with production probably tripling that produced this season.

South Queensland Report

By Daryl Boardman,
Avocados Australia Director



Since the last report, Southern Queensland has had good rain with falls up to 200mm in some locations.

Some areas have experienced prolonged periods of cloudy, wet weather during flowering, so time will tell as to how this will affect fruit set.

Some areas have experienced bad hail damage already in the Kumbia and Blackbutt regions. I encourage you to read the article from Simon Newett, Queensland DAF, on page 27 for how to recover after hail damage. I know this will be a longer term proposition, which means it's important to take the right steps now, to ensure secondary issues such as fungi, insect attack, or sunburn don't further delay recovery. If you have been impacted by storms, you can read more about the assistance available from the Queensland Government in John Walsh's report for the Central Queensland region.

As South Queensland growers, you would have recently received a letter from me, regarding membership of Avocados Australia. I would ask that everyone who feels your organisation is doing

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Around Australia continued

a good job in keeping the industry strong, continue to support Avocados Australia. It is only with the support of the grower memberships that this is possible; I would urge everyone to please join or renew their membership.

I would like to wish everyone a great summer and Christmas, and hopefully the storms will stay away as we head into Summer.

Sunshine Coast Report

By Robert Price, Avocados Australia Director



Well picking is, for the most part, over in our area with good quantities of fruit with varying quality. This season though returns to the growers are beginning to show the strains of oversupply, particularly from the Bundaberg/Childers area with prices being down 15% to 30%. At the time of writing, the market is still in the doldrums as New Zealand and Western Australis's fruit hits the market. There were also reports that fruit was ripening faster than is normally expected, meaning that handling procedures need to be adjusted to ensure final consumer quality was maintained.

It's been another interesting season with scattered devastating hailstorms and wind. While not a lot of damage to avocado crops occurred in our immediate area, other horticulturists did suffer some severe damage.

So what of the next season? Well so far the trees have been flowering unevenly, by that I mean that some trees will have flowered and others still have not broken bud. I was at a farm late October and the trees were just coming into flower; the wiles of nature. Although fruit set looks good, the crop on average may be a bit down on last year. The trees are generally healthy in the area as it seems the recent rain has prompted a strong flush of growth, something that wasn't as pronounced over the recent dry period.

Central Queensland Report

By John Walsh, Avocados Australia Director



The Central Queensland season has finished well, however, prices were down a fraction on last year for the region. This highlights the importance of good, coordinated marketing to move the volume of supply that's now coming online. Australia is expecting to produce about 115,000 tonnes by 2025 and as an industry we are going to have to work together and be proactive in developing our markets if we want to sustain prices.

As you'll read in the *OrchardInfo* summary on page 14, the rate of new plantings has started to plateau but we've had more than one million trees planted nationally in the last five years. It's going to take a coordinated approach to marketing and quality to ensure a sustainable industry as those trees



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progressively come online.

In terms of season, at this time of year in Central Queensland it's important that we have good monitoring and in-field spraying programs to control pests and diseases. We have had a good crop set so far.

However, quite a few farmers have been affected by early season hail, and they have a long recovery period ahead of them. You can read more from the Queensland Department of Agriculture and Fisheries on page 27, about what to watch for and steps to take.

The Queensland Rural and Industry Development Authority now has financial assistance available via the Natural Disaster Relief and Recovery Arrangements, for those affected by the Wide Bay-Burnett Severe Storms between 11-14 October 2018. Financial assistance has been activated for primary producers to access low-interest Natural Disaster Assistance and Essential Working Capital Loans. Visit www.qrida.qld.gov.au/current-programs/Disaster-recovery or call 1800 623 946. Those affected directly by the storms may be eligible for low interest loans of up to \$100,000 or \$250,000, depending on the assistance pool.

North Queensland Report

By Jim Kochi, Avocados Australia Director



The landscape around the NQ region is now starting to show the results of the new plantings of the past few years. These trees are now producing and will add to the volume each year on from now.

The *Quarterly Infocado Report: Crop Forecast October 2018* shows a forecast of 3.57 million trays for North Queensland in 2019 compared to the actual production in 2018 being 4.38 million trays. This is a drop of 18.5% on last season's supply.

Now really, can this be the reality?

North Queensland growing conditions have been good through flowering and I would expect a better than average crop for both Shepard and Hass. It is still early days to see the full extent of the crop load, so I would encourage growers to have a good look at their trees and make the next forecast submission more accurate.

Years of past experience shows that the market performs better for growers when the market has accurate, timely information so all the stakeholders can prepare programmes to move the volume through the system. Last year saw volumes above

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Around Australia continued

forecast being sent to market and this left great volumes in coldrooms without a home to go to. These actions reverberate around the market as gossip can scare the market, as it did, and caused a rapid drop in prices. Similarly, immature fruit on the market causes a slow-down in sales and the backup of fruit results in lower prices.

The best place to store an avocado is on the tree so harvesting should be matched to what your market agent or consolidator advises you that can be moved.

I have used this saying before and it is still relevant: "failing to prepare is preparing to fail".

Tamborine and Northern Rivers Report

By Tom Silver, Avocados Australia Director

The season has finished for our region, with most growers having below average yields but generally much better quality. It's still early days but at this stage the 2019 flowering is looking good after a very dry, but mild, winter and regular rainfall in spring.

Prices for the season, although still good for premium fruit, did



not live up to those from previous years and are definitely an insight into the future.

Increased plantings are going to lead to reduced margins and are a wake-up call for all growers to monitor their inputs and to ensure that the majority of fruit grown is of premium grade as this fruit will command the best prices.

Avocados Australia is working hard to be ready for these increased supplies, however, it can be accepted that the next 10 years will not be as good as the last 10 years, and growers both existing and new need to be ready for this.



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Avocado industry worth \$557 million

Australia's avocado production increased to 77,000 tonnes in 2017/18 with a consumer market value of \$958 million.

Avocados Australia Chief Executive Officer John Tyas said the industry was now on track to produce about 115,000 tonnes a year by 2025, a fact that was both encouraging and a cause for caution.

"One-third of Australia's avocado trees have yet to reach their peak production years but enough of the new plantings have come on line this year to boost the industry above last year's 66,000t," Mr Tyas said.

"Our production in 2017/18 was 17% more than the previous year, with a gross value of production estimated at \$557 million."

Mr Tyas said the increased production and new plantings demonstrated a belief that the Australian industry had room to grow.

"The fact that our future projections continue to increase underscores the confidence of the industry," he said.

"However, it also highlights the need for us to continue to work to increase domestic consumption, build the capacity of our existing export markets and gain access to new international markets.

"The 2017/18 gross value of production was \$557 million, the first time it's reached above \$500 million. This estimate has

been validated by Fresh Logic, an independent company that prepares annual statistics for Hort Innovation.

"If we want to see continued increase in the value of production, in an era of increasing supply, we will need to maintain our focus on delivering a high-quality product for consumers, at every purchase."

Mr Tyas said while more than 95% of the Australian crop was consumed domestically today, that would not always be the case.

"Even when production does reach 115,000t/year, Australia will not be a bulk supplier of avocados on the world market.

"The future of the industry depends on us providing a quality, reliable product to our domestic and international consumers, and providing it at every purchase."

Facts at a Glance

Avocados Australia has produced its annual key statistics document, *Facts At A Glance*, for 2017/18.

Australian avocado growers produced 77,320 tonnes of avocados in the 2017/18 financial year, a 17% increase on the previous financial year. As a state, Queensland continues to produce the majority of Australian avocados, with 62% of production.

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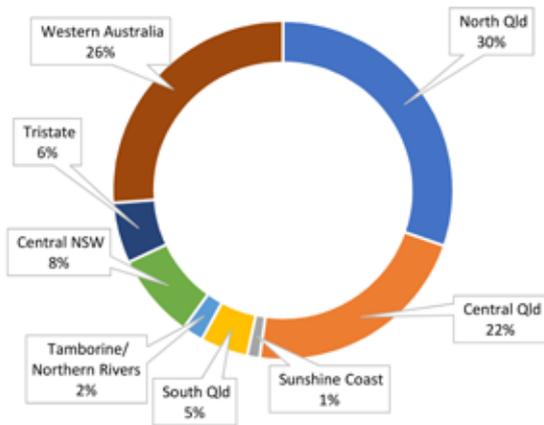
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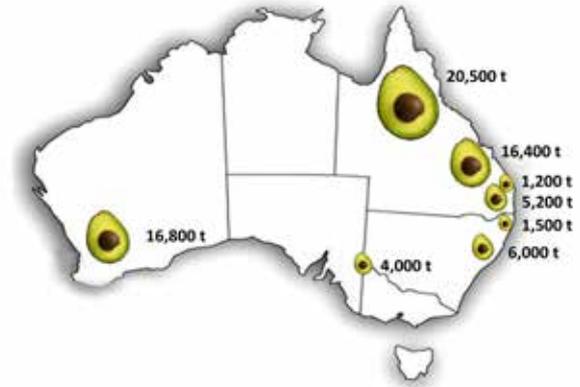
Avocado industry worth \$557 million continued

The North Queensland growing region supplied the largest proportion of avocados, at 30% of national production, with Western Australia producing the next largest share at 26%, continuing their steady increase during recent years. Central Queensland produced 22% of the share, and along with North Queensland, shared a significant increase in Shepard variety production in the last year.

Avocado production by region 2017/2018



In Australia, avocados are produced all year round due to the range of climates and conditions in our eight major avocado growing regions. Hass is the main avocado variety, and is produced almost all year round. In 2017/18 Hass represented 78% of production. Shepard, which is grown in Queensland



* Annual tonnes produced in each region, averaged over two years* 2016/17 and 2017/18. A two year average is used to compare production by region, because some regions have irregular bearing years, meaning crop load may vary significantly from year to year.



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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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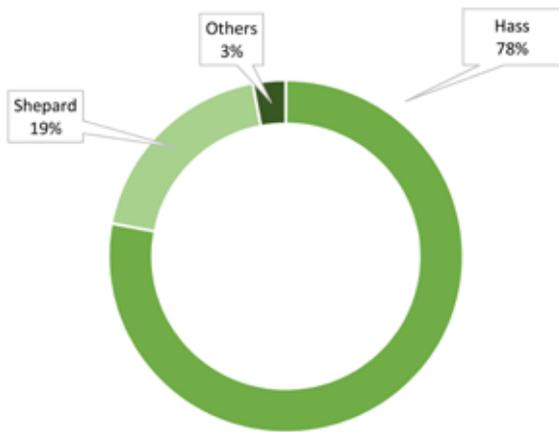
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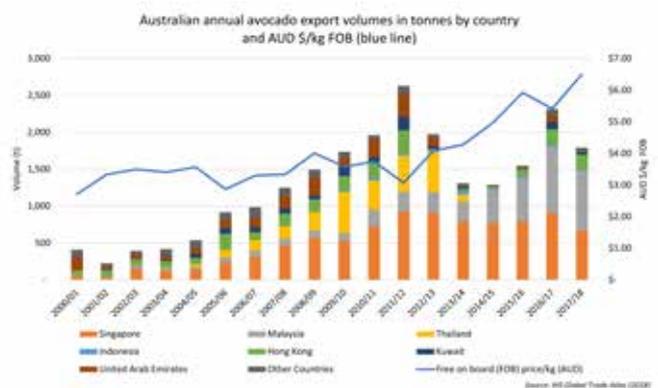
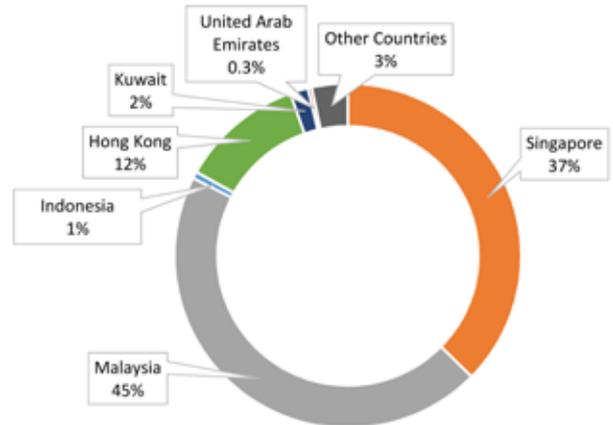
through late Summer and Autumn, made up 19% of production, and at that time of year, is the dominant Australian variety on the market.

Australian avocado production by variety 2017/18



In both production and exports, Australia is currently a small player in the world avocado market. Ongoing activity is underway targeting Australia's growth in export markets with Malaysia and Singapore currently Australia's main avocado export markets.

Australia's export markets in 2017/18



Consumption of avocados in Australia in 2017/18 remained steady at 3.5kg per person. Imported New Zealand fruit supplements Australian supply during that country's harvest season during Spring and Summer.

Australian production is forecast to increase strongly during the next few years, with about 115,000t/year expected to be produced by 2025.



More information

Find the full document at www.avocado.org.au/news-publications/statistics/.

Acknowledgements

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

Australia now has more than two million avocado trees

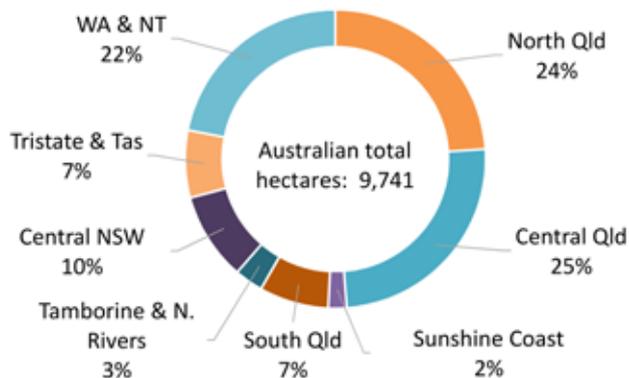
By Sue Plunkett Cole, Data Analyst Avocados Australia

In October, Avocados Australia released the *2018 Annual OrchardInfo Report* to contributors.

As an overview, the tree census indicates that at 1 August 2018, the number of avocado trees planted in orchards across Australia was 2.13 million, covering 9,741 hectares.

About 1.25 million trees were planted in the last five years, and 41% (approx. 880,000) were at least six-years-old. We have seen a plateauing of new plantings in some regions in the last year compared to 2016 and 2017, although Western Australian, Central Queensland and Tristate have continued to grow.

Proportions of all Australian avocado hectares (at 1/8/2018)

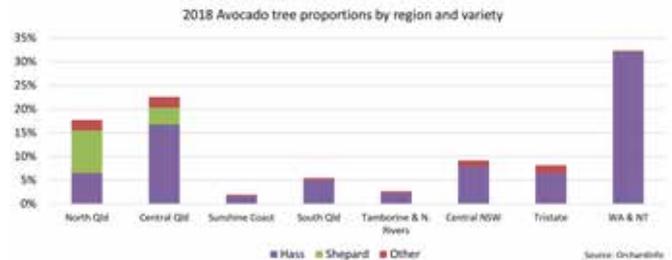


Once again, avocado growers are to be commended on their very quick and thorough responses to the tree census and productivity survey. We now have three years of continuously high participation rates, and intend to maintain these high rates. This is important in order to attribute overall differences from year to year to recently planted or removed trees, rather than being due to fluctuations in participation.

In appreciation of our growers' contribution each year to the report, and as an incentive to continue their contributions, the report is released to only those who participate. We also continue to work on simplifying the process. Did you know that the average time taken to complete the productivity survey was only 4 minutes 17 seconds?

All growers and industry stakeholders benefit from the annual and longitudinal collection of *OrchardInfo* data which is used to develop informative reports such as:

- identification of trends over years in production and potential supply
- analysis of annual planting rates by variety and region
- productivity rates and trends over years
- comparisons of productivity by region and variety.



Prize winners for 2018

Contributors had to answer both the tree census and productivity survey before the cut off of 9 September to enter the draw for gift cards. We had a high number of growers in the draw this year and it was great to see so many new growers engaging with the tree census. This year's winners were:

Region Trading Name

NQ	A & CV Tatti	Angelo Tatti & Cristine De Mero-Tatti
Tas	Avoland	Paul & Maria Bidwell
NT	Bosanac Farm NT	Mathew & Amanda Bosanac
WA	Canterbury	Ken & Kay Gwynne
SQ	Halo Farm	Chip & Joanne Saint
CNSW	Kulnura Ambrosia Avocados	Ian & Rhonda Robba
CQ	N & N Donaldson & Co	Neil & Nicola Donaldson
SC	PM & TC French	Tom & Pru French
WA	Pow Brook Pty Ltd	Doug Pow & Susan Brook
TNR	WJ Row	William Row

More information

For more information on how to contribute to *OrchardInfo* and receive the detailed reports, please contact your Infocado team on 07 3846 6566 or infocado@avocado.org.au.

Acknowledgements

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

Avocados Australia at Asia Fruit Logistica

Avocados Australia had a presence at Asia Fruit Logistica 2018 in Hong Kong this year, as part of Hort Innovation's Taste Australia pavilion.

Avocados Australia Communications Manager Lisa Yorkston attended the Asiafruit Congress and Asia Fruit Logistica on behalf of the organisation this year. As well as providing information to visitors at the Asia Fruit Logistica stand, Lisa also covered various panel sessions of interest to the Australian industry and these are reported in the following pages.

The stand was an opportunity to showcase the new materials developed as part of the industry's Package Assisting Small Exporters (PASE) project. The 'Ripe & Ready' program, managed by Avocados Australia and funded through the Australian Government Department of Agriculture and Water Resource's PASE program, Sunfresh, The Avolution and the Avocado Export Company.

The consumer materials created through the PASE project, including header cards and an informational booklet, were complemented with back of store materials.

All of these materials, and more, can now be found on the new Global section of the industry's website.

Avocados Australia CEO John Tyas said the new section provided avocado education and training resources for the industry's international customers.

"Covering both the retail and supply chain, the pages provide access to relevant existing resources, new internationally specific materials and includes a materials order form, to provide access to resources for in-country promotions," he said.

In addition, Avocados Australia was also able to provide general information about production in Australia to Asia Fruit Logistica attendees.

More information

www.avocado.org.au/global/globalsupply/



Courtesy: Asia Fruit Logistica

Taste Australia's Hong Kong success

Hort Innovation's Taste Australia returned to Asia Fruit Logistica (AFL) in 2018, marking a successful first 12 months for the foreign trade initiative.

Underpinned by more than \$40 million in research and development projects, and backed by world-class science and technology, the Taste Australia initiative was developed in response to industry calls for a cohesive, national export project to drive foreign interest and demand for Australian horticultural products.

The initiative was launched at AFL last year, which is the largest specialised fruit and vegetable trade event in Asia. The project proved so successful, it is now being rolled out in 10 countries across Asia and the Middle East.

Australian growers and industry organisations, including Avocados Australia, once again showcased their premium products under the Taste Australia banner at AFL with a delegation of more than 220 stakeholders, representing 80 Australian businesses across 528 square metres.

Speaking during AFL 2018, new Hort Innovation CEO Matt Brand said Asia was a large opportunity for Australia.

"Export is where it's at. Export creates a number of opportunities, even domestically, because if we start exporting more, it will start to put some pressure on prices and behaviours domestically which means what we might see, is farmers being paid better for what they do every day," Mr Brand said.

The extensive trade effort during the last 12 months saw the value of fresh horticultural exports reach a record \$2.18 billion for the year ending June 2018.

Hort Innovation General Manager for Trade, Michael Rogers, said the export results not only demonstrated the value of Taste Australia activities, but also positioned the Australian horticultural industry well within foreign markets.

"Australia has a solid reputation for delivering high-end produce



Hort Innovation CEO Matt Brand and Chair Selwyn-Snell at Asia Fruit Logistica 2018.

that has undergone the most rigorous inspections along all stages of the supply chain, and the Taste Australia brand builds on this," he said.

"We have been exhibiting at Asia Fruit Logistica for more than 10 years. When Taste Australia launched last year, we found it increased our engagement with key stakeholders across Asia.

"Through the Taste Australia brand, we are strengthening our homegrown produce on a global stage, bringing high quality, high-end premium goods to international markets."

The Taste Australia campaign is funded by Hort Innovation using industry research, development and marketing levies and funds from the Australian Government.

More information

For more information about Taste Australia or the Hort Innovation presence at AFL, visit www.tasteaustralia.net.au.



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Asia Fruit Logistica & Asiafruit Congress



Avolution CEO Antony Allen and Daryl Boardman, Sunnyspot Packhouse, Ravensbourne Q, at the Asiafruit Congress.



Hort Innovation Director Jenny Margetts (right) with Oleg Nicetic from The University of Queensland and Robert Gray from Green Skin Avocados.



Annaleise and Lachlan Donovan, Dons Fort, Childers Q, at the Asiafruit Congress.



Jennie Franceschi, Karri Country Produce, Manjimup WA and Denis Roe, Subtropical Fruit Farm Consultancy, Sunshine Coast Q catching up at Asia Fruit Logistica.



Greg Smith and Graeme Barnes, EE Muir, at the Avocados Australia stand in the Taste Australia pavilion.



George Ipsen, Mayfield Park Farms, Manjimup WA, dropped by the Avocados Australia stand.

Asian population demand excellence

Asia is home to half the world's population, and a relatively young population at that, attendees at the 2018 Asiafruit Congress in Hong Kong were told.

Asiafruit Magazine Editorial Director, Asia, John Hey said aspirational consumers with disposable income were spending on higher value foods.



Since 1998, Asia's fresh fruit imports have grown from 4.9 million tonnes, to 11.8m, while Asia's fresh fruit exports have also grown, from 2.9m tonnes to 10.6m tonnes.

"We're seeing a growing demand for premium, Western (brands) in China but also in a number of other markets around Asia," Mr Hey said.

"Part of this demand for imported produce has been through food safety scares," he said.

Mr Hey said another key trend was the way China had matured as a market, with forecasts 80% of consumer growth would come from the upper middle class, and in what are currently second tier cities.

"We're only scratching the surface of this consumer market. Consumers in cities across China and Indonesia and India are still really discovering imported fruits, and are very much under-served in their demands due to logistics and other issues."

Avocados Australia CEO John Tyas said this could be an important



Courtesy: Asia Fruit Logistica

consideration for the Australian industry, as domestic production moved toward 115,000 tonnes annually by 2025.

"The Australian industry is currently a small player in the international market and while we do expect our export volumes to increase in coming years, we will remain a supplier of top-quality Premium grade avocados (mainly Hass) in the international market, rather than a bulk commodity supplier," Mr Tyas said.

"It's going to be important for the Australian industry that our export markets grow with us, and that internally our focus on providing that premium product does not waver, because these consumers are going to demand the best."

At the Asiafruit Congress, Mr Hey said the current main source of fresh fruit in Asia, was in fact Asia, at 62%. This is followed by Southern Hemisphere suppliers at 18%, and then the USA, Europe and others.

And this food is moving in a changing food retail landscape. Mr Hey said Asia had already seen the movement of trade from wet markets to supermarkets in the 1990s, especially in Hong Kong and Singapore.

"When those first modern retailers entered Asia in the 1990s, I think a lot of people thought the traditional retail trade would gradually be eliminated," he said.

However, he said the new supermarkets had not been able to "own" the market as they had in Europe or the US, instead a combination of wet markets, large format stores, fresh food specialists and digital exists.



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The keys to doing business in Asia

As the Australian avocado industry looks to increase its presence in Asian markets, branding expert Jerry Clode warns brands cannot simply be copied, pasted and sent to Asia.

Speaking at Asia Fruit Logistica 2018 with AVANZA brand representatives Tony Ponder and Steve Trickett from AVOCO, Mr Clode said while his 10 commandments advice was based on China, it was applicable to other Asian markets as well.

"We need to think about the local content, we need to think about how we can be relevant to those consumers' lives," Mr Clode said.

"What happens in China and Asia more generally, marketers, brands, get far too excited; they forget about the fundamentals of marketing

"Positioning, segmentation, brand story, most importantly, you have to be different to your competitors otherwise no-one will notice you.

"A lot of these lessons are simply thrown out the window as everyone is super excited about Asia, as long as people are willing to buy our stuff, we can sell it."

Mr Clode said the challenge was fulfilling the dreams of Asian consumers, the dream of mothers who want to give their children nature and clean environment and who do that through the fruit they buy.

"We don't have a small role to play, we have a big role in people's lives," he said.

Are you pretty?

Mr Ponder said New Zealand was clearly not going to be a volume player, and AVANZA realised they would struggle to be relevant in such a large market with such a large demand opportunity.

"We needed to understand how to best build a brand connection."

Mr Ponder said they first came to China five years ago, not in a commercial sense but to understand the market, the category, the consumers and the socialisation, in order to build an understanding of what was needed in China.

Mr Clode said the first barrier was that the avocado was not considered an attractive fruit, and the Chinese name, crocodile fruit, was terrible.

"We had to ask ourselves how we could turn this negative into a positive," Mr Clode said.

He said it was necessary to understand how local consumers perceived the size, colour and attributes of the fruit, and turn any negatives to your advantage.

Core reason to believe?

"Are you providing a clear reason or context for consumers to try your product," Mr Clode said.

"Are you assuming Chinese or Asian consumers are simply going to engage with your brand in the same way as Western consumers?"

Forcing locals to change?

Mr Clode said a good example was jam.

"Chinese consumers don't use jam like westerners, you would be surprised where jam goes. It goes into savoury, it goes into cereal, it goes everywhere," he said.

He said it was important to ensure you weren't assuming behaviour, or expecting your product would be used the same way as in the domestic market.

Value of your nationality?

Mr Clode said a lot of nations could claim to be beautiful, what was important was to explain what you specifically offered as a nation.

For example, he said American brands often talked technology, ignoring their natural advantages in terms of agriculture as a positioning point.

"People are paying so much for fruit, they literally expect to be able to escape, to be able to experience a more pure, uncompromised environment," he said.

Supermarket personality

Mr Clode said Chinese consumers and supermums spent five to six hours a day on WeChat and it was important to realise they expected to use their mobile phone at the supermarket.

"They're expecting to scan things, they're expecting to take that experience home with them," he said.

He said this made it important to think about the display that came with the fruit, especially for those supermums who would take their children with them because they considered shopping for fresh fruit and vegetables to be a "biology class".

"They show their children 'this is where the oranges are from, this is where the avocado is from' because they want to be able to connect their children with the idea of nature, with the idea of healthy and natural snacking."



Jerry Clode, Resonance, China (centre) with Tony Ponder and Steve Trickett from New Zealand's AVANZA shared their Top 10 commandments for brand localisation in Asia, at the 2018 Asia Fruit Logistica.

AVANZA is positioning itself to tap into the desires of Chinese “supermums” who want to be seen as upper middle class.

According to the company’s September 2018 newsletter, the campaign will be supported by in-store demonstrations and the WeChat app, to position AVANZA as the supplier of premium quality New Zealand avocados.

The company says that for mothers of school-age children in China, in-depth market research shows avocados are a symbol of prosperity – purchasing them is a sign that you want the very best for your family.

“Premium prices are no barrier for this consumer group which AVANZA is targeting in niche retail stores with a new Chinese brand that reflects the avocado’s status as a high-quality super food.”

AVOCO is exporting avocados to China under its AVANZA brand for the first time since New Zealand gained market access earlier this year.

AVOCO’s marketing and communications manager Steve Trickett said the promotional plan and its niche market focus would help to differentiate AVANZA avocados from fruit sourced from South American heavyweights, including Chile and Peru.

AVANZA, with around 65% projected share of New Zealand exports, will be the industry leader in China. In preparation, AVANZA appointed Shanghai-based branding agency, Resonance China, to conduct research to better understand consumer behaviours and attitudes towards avocados, especially among the group labelled ‘supermums’.

“These are mums who are very independent in their own right and who are very focused on their children and spend a lot of money on fresh produce, not really having any price sensitivity in that area,” says Resonance China director Jerry Clode, a Kiwi expat.

His company’s research discovered that many mothers in this consumer group disliked the taste and consistency of avocado after trying it the first time. Despite this, they persevered and amalgamated it into their families’ diets as they believed it had nutritional benefits.

“One thing we noticed was that avocado was a very important part of middle class status,” Mr Clode said.

“When we went to people’s homes, they had avocado on display in their fruit bowls. It’s important in symbolising modern health, wealth and family.”

This involved creating the idea that AVANZA avocados “reach a new standard” of quality compared to other imports. This messaging is reflected in new fruit labels carrying the Chinese name for AVANZA, “Chao niu guo”, on large-sized fruit.

In the company newsletter, Mr Trickett said when translated, to a younger generation the name implied ‘next-level cool fruit’ or ‘next-level cool’, whereas the more literal translation reads as “the super one”.

“The name is a call-to-action of sorts, and if you want to be seen as ‘next-level cool’ or feed your family ‘super food’, it’s something you need to have in your shopping basket.”

Clear digital plan?

Mr Clode said one key mistake was taking a Facebook strategy and attempting to “force that into a China reality”.

“Obviously it’s completely different,” he said.

He said, in China, the offline and online tone must match, rather than being “cheeky” on social media and “serious” in-store.

Mr Clode said for their digital presence for an eight-week campaign, AVANZA had created a mini app that allowed shoppers to scan and learn more about the company, where the avocados were grown, simple communication messages that could be easily shared.

What is your category role?

Mr Clode said it was important to be clear about whether your goal was to be a category leader, a challenger, a disrupter, or whether you are introducing a completely different format.

“When you are first going into China and Asia, how does that category role change over time?”

Who is your community?

Mr Clode said given the size of the market, it was important to think clearly about your segment, rather than simply targeting the “middle class”.

“In China, the middle class is approximately 400 million people dispersed across a huge country, so that’s not specific enough,” he said.

Tech/nature expectation?

“The rest of the world is going very green, is going very organic; China is, but sustainability and environmentalism is very, very distant, it’s not every day,” he said.

“People are more focussed on what tech can do to give them the most uncompromised, the most natural products into their lives.

“A very important part of this, is that in China, people are paying an absolute shedload for fruit. If I’m paying so much for an avocado, then obviously I want it to be perfect.”

Mr Clode said part of that equation was for the brand to show what they were doing to ensure the consumer was receiving the very best fruit.

“When I talk to people (consumers) about where the best fruit comes from, they are talking to me about robots, they are talking to me about AI, they’re talking about intelligent systems that ensure the quality.

“The balance between technology and nature is very different in China.”

Mr Clode said talking about fruit being “from the farm” was a mismatch in China, because consumers believed that if there was a farmer involved, there was the chance the fruit could be compromised and not perfect.

Role in local day-to-day?

Mr Clode said unlike Western nations, in China consumers wanted the brand in their homes, on their fridges, on the branded fruit bowl.

PASE delivers 'ripe & ready'

Retailers in Malaysia, Singapore and Hong Kong are now aware of the benefit of providing "ripe and ready" Australian avocados, thanks to a recently completed project.

The project was managed by Avocados Australia and funded through the Australian Government Department of Agriculture and Water Resource's Package Assisting Small Exporters (PASE) program, Sunfresh, The Avolution and the Avocado Export Company.

"The PASE project provided an excellent platform to position Australian avocados as a premium offering with key retailers in Asian export markets," Avocados Australia CEO John Tyas said.

"The additional market engagement achieved through this project has positioned the industry well in light of the significant increase in Australian supply that is starting to impact the market."

Mr Tyas said the project had been able to influence the purchasing behaviours of retailers in these markets.

"By introducing this innovation, the Australian avocado industry has the opportunity to grow demand while protecting its premium quality position in these markets and the value in its supply chains. This is recognised by the exporters, importers and retailers in these chains," he said.

Mr Tyas said ongoing activity was expected to flow from the project.

"The successful engagement with key supply chain partners in Malaysia, Singapore and Hong Kong has provided the momentum for the participating exporters to continue export development programs in these markets," he said.

"The training package and materials have been developed so they can be accessed by other Australian exporters and they provide the resources for export to be scaled up as demand increases for Australian 'ripe and ready' fruit."

The available materials have been collated in the new Global section of the avocado industry website, available via www.avocado.org.au/global/. Some of the available materials were also showcased during the 2018 Asia Fruit Logistica, in Hong Kong in September. Avocados Australia had a stand, as part of the Hort Innovation Taste Australia pavilion.

"Additional materials will be added in future, as we know how important it is to provide these resources to those in our export markets," Mr Tyas said.

"The exporters involved in the project will also continue to support the 'ripe and ready' program through their supply chains.

Mr Tyas said the project provided some valuable insights into the potential of Asian markets, for the Australian industry.

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Key insights from the project included:

- there is enormous potential for demand growth as markets become more familiar with avocados
- there is an on-going need for training supply chain participants, especially retail staff, in handling, selling and usage of avocados
- there is an on-going need for the promotion of avocados in emerging markets and especially Australian avocados, so consumers are aware of the benefits of buying Australian (fresher and higher quality).

“We also found there was existing consumer demand for ripe and ready avocados, but importers and retailers need support to overcome concerns about increased costs and wastage,” Mr Tyas said.

“There is a clear need for ongoing in-market work, for both the importer/retailers and the consumers, but the potential benefits for the Australian industry will make this worthwhile.”

More information

www.avocado.org.au/global/



[QUALITY = SALES]

Always handle fruit with care

Avocados bruise easily.

Don't stack fruit on display more than 2 layers deep.

Get the temperature right

Check with your quality manager about the best temperatures to hold avocados.

Good displays increase sales

Use 'ripe' stickers or display information to help the customer identify ripe fruit.

Remove over-ripe or damaged fruit from display.

Turn over stock every 2 - 4 days.

For more information on handling Australian avocados visit Avocados Australia www.avocado.org.au or contact admin@avocado.org.au

This project is being funded by the Australian Government's Package Assisting Small Exporters Program and major Australian avocado exporters



Preparing for future imports

Australia's high seasonal peaks in pricing, coupled with a growth in demand makes the domestic market attractive to global producers, a newly released report has found.

The *Potential impact of Chilean and Peruvian avocado imports for the Australian avocado industry (AV17004)* report prepared for Hort Innovation by Coriolis Australia was publicly released recently.

Avocados Australia CEO John Tyas said both Chile and Peru had requested market access to Australia, for avocados. Chile requested access about a decade ago, but Peru's request was only made in 2017.

"That's why we requested Hort Innovation commission a project to investigate the potential implications for our domestic industry," he said.

"The report, quite rightly, notes that to date the Australian market has been insulated from the vagaries of the global market, with only New Zealand able to import fresh avocado."

In fact, he said the report noted Australian avocado imports (from New Zealand) had been more than 50% above the world import price for decades.

The key takeaways from the research are:

- Chilean avocados are likely to have access to Australia in less than two years from the report's publication, however, processing consignments at the Australian border is a significant risk for them.
- Chile is likely to roll out avocados over a three-phase process: "Test", "Growth" and "Equilibrium"
- the Australian market will accept Chilean avocados, in particular during the summer months, when Australian supply is low, and prices are high
- the arrival of imports will, in time, move prices to the world price, which is lower; three models are proposed for how the arrival of fruit will play out: "Goldilocks", "Growth Stops" and "The Squeeze"
- three broad recommendations are made: (1) increase efficiencies to reduce costs, (2) develop strong alliances and (3) implement an export strategy.

Mr Tyas said the industry did need to be prepared for imports from a broader range of countries, with a need to focus on improved quality to sustain demand for Australian avocados and develop additional international markets as the size of the domestic crop increased to about 115,000 tonnes by 2025.

According to the AV17004 report, the industry will need to increase efficiencies and decrease costs to prepare to compete at the world price.

"Industry must measure and monitor orchard performance and share best practice models. Industry must assess major 'cost buckets' and research best practice models to reduce costs," the report said.

"Second, the industry must develop strong relationships and alliances to create scale. Strong alliances are required for 12-month supply.

"Third, to grow the industry, create higher value opportunities and to reduce channel risk through diversification requires a coherent, robust and ambitious export development strategy and implementation plan. Avocados Australia is currently working with key stakeholders to develop a new export plan for the industry."

The project

The objective of the project was to provide a robust, fact-based assessment of the impact of Chilean and Peruvian avocado market access on the Australian avocado industry. As an outcome, it provides core industry stakeholders (growers, packers, Avocados Australia, and Hort Innovation) the information and insights needed to plan a strategy for the future in this challenging new world.

The project outlines: the conditions required by Chilean and Peruvian producers to export product into Australia and analyses the commercial and competitive impact that Chilean and/or Peruvian imports would have on the Australian avocado industry through likely imports.

According to the report, Chile is clearly a more imminent threat to Australian producers, compared to Peru, as they are likely to gain access within two years.

"Peru's timeframe is less certain, but does not appear to be a short or medium term threat," the report says.

"Chilean fresh avocados are currently under a Biosecurity Import Requirements review by the Australian Government, while Peru has recently applied for access.

Transport options

Chile is well on its way to gaining "theoretical" access to Australia, the report says.

"The preliminary assessment identified five potential pests of quarantine concern – all existing in other horticultural imports, that gain access to Australia," it said.

"A review of similar existing Australian protocols suggest Chile is able to achieve the likely requirements, as they successfully export to other biosecure markets like Japan, China and the USA."

The report said Chile had two options to get avocados to Australia, with seafreight the more likely option when compared to airfreight.

"Airfreight is not a viable option as there is very low availability of freight space on the limited number of direct passenger flights from Santiago to Australia (three direct flights per week)," the report said.

"The maximum amount that Chile could supply by direct

airfreight is small (~24,000kg/week), expensive (~A\$44-55/tray) and unlikely to impact the market. A chartered flight could take approximately 80,000kg. Indicative prices for chartered cargo flights are more price competitive than passenger options (~A\$20/tray), but highly risky."

Therefore, the report determined, seafreight is the most likely option but the key issue was timeframes as the fruit had to arrive in Australia in good condition.

The report said there were a variety of scenarios for transport, but Chilean avocados could reach Australia, from pick to clearance, between 18 and 27 days. Dedicated reefer ships would provide the shortest transit time.

"In other markets, South American exporters often work together for scale to fill reefers. Chile can put on seasonal reefers for quantities around 4,000 tonnes," the report said.

As a comparison, six dedicated reefers would displace all of New Zealand's current volume to Australia. This would be a likely medium term strategy."

Clearance

A key part of the chain for fruit from either country is the Australian border. As noted in the report, inspection and clearance timeframes can vary, particularly if any suspect or banned insects are identified. And this could have an impact on the domestic market as well.

"Given the long transportation times (relative to domestic and New Zealand fruit), for the importation of fruit to be successful it would be critical for Chilean fruit to be clean and for the process through customs to be efficient and without any problems," the report said.

"Delayed product would be at the end of its life and would likely be 'dumped' on the market, impacting Australian market prices in the short term."

"Test", "Growth" and "Equilibrium"

Within the test phase, the report suggests Chile would be learning about the Australian market, with low volumes expected in the first four to five years.

"Fruit quality will be variable, and most fruit will be sold to foodservice and wholesale markets with limited impact on price. We anticipate initial volumes of 100 tonnes per year rising to 800 tonnes during this phase. Models suggest that Chile can land in Australia with a significant price advantage over New Zealand fruit," the report said.

In the Growth phase, more fruit would be expected, potentially 1,200-1,900 tonnes, possibly reaching 10,000t in 10 years. The report suggests this will occur as fruit quality improves and smaller supermarket chains take supply.

"We do not expect the major retailers to take South American fruit initially, but there will be strong demand from foodservice

and the wholesale markets, in particular when prices for local fruit are high during the summer months," the report said.

"As Chilean and Peruvian volumes grow, various market participants will be tempted into buying product. Aldi, Costco and Kaufland all buy avocados from Chile globally. Despite claims to favour buying Australian, Woolworths and Coles would eventually buy Chilean fruit as well."

By the Equilibrium phase, the report suggests Chile could be supplying between 20-30% of the market, with Hass avocados sold through all channels.

The world price

The report suggests the arrival of global fruit will reduce Australian price premiums, moving the market to the world price (plus freight), with a 15-20% Australian premium.

"All growers will have their profitability squeezed as Australia moves towards the world price (average world price across all markets was CIF (cost insurance and freight) A\$21.06/tray in 2017)," the report said.

"Goldilocks", "Growth Stops" and "Squeeze"

According to the report, a Goldilocks model is one where consumption growth accelerates, with the new entrant volume purely incremental; Growth Stops is where consumption growth continues but the new entrant has better economics and takes the incremental growth; and The Squeeze is where the new entrant has significantly better economics, leading to shrinkage in the volume share of existing operators.

"Which model prevails in Australia in the future depends on the actions of industry leadership now and over the next few years," the report notes.

More information

A copy of this report, including a full methodology, can be found in the Best Practice Resource, in the R&D Reports section of the BPR Library, www.avocado.org.au/best-practice-resource/.

Acknowledgement

This project was funded by Hort Innovation, using the avocado research and development levy and contributions from the Australian Government.

Global market reports now available

Two new reports have been developed for the Australian avocado industry, providing the latest information on international suppliers and import markets.

The *Avocado Producers and Market Suppliers* report provides an overview of the world's major producers and market suppliers, and the *Avocado Import Markets 2018* report provides the latest on the various import markets, from Asia to Europe including key markets for Australian avocado suppliers. Together, these reports provide useful information about avocado global market opportunities, competitor supply times, volumes and prices.

The two new global market reports have been developed and added to the industry website, in the Best Practice Resource Library, under the Export heading.

Avocado Producers and Market Suppliers

The global trade in avocados reported by UN Comtrade in 2017 was 2.14 million tonnes worth AU\$8.1 billion equivalent. The global trade volume has increased on average by 13.3% per year over the past five years.

The Food & Agriculture Organization of the United Nations reported (via FAOSTAT) global production of avocados as 5.5 million tonnes in 2016.

According to the report, *Mexico* is the world's largest producer and exporter of avocados with a production of almost 1.9 million tonnes or 34% of global production in 2016, and export 897,000 tonnes in 2017. Mexico exports avocados all year round although the main export season is from October to March. Mexico exports approximately 50% of its production, mostly to the United States.

In terms of exporters, *Peru* is the second largest, and the largest exporter of avocados from the southern hemisphere. Peru exports avocados from March to August. Peru gained access to Japan in 2014 and is complementing the Mexican supply to Japan from May to August, albeit at low volumes relative to Mexico. Peru is also supplying to China from 2016.

The largest avocado exporter from Africa is now *Kenya*, mainly focussing on Europe and the Middle East. In 2017 the country exported 51,507t according to the report, with a notably low FOB unit value of AU\$1.98/kg.

The largest producer in Europe is *Spain*, exporting 107,000t in 2017, 2017 (including some imported fruit), mostly to other European countries.

Israel is the largest avocado producer in the Middle East, producing 101,000t in 2016, with a five-year growth trend of 7.8%/year, according to the report. A majority of production, 80,203t, was exported in 2017, headed primarily for Europe and then Russia.

Avocado import markets

The *United States* is the largest single country importer of avocados (*Table 1*), importing more than 900,000 tonnes in 2017. Europe is also a large importer by region with combined imports of 842,000 tonnes although intra-European trade reduces the net imports to 414,000 tonnes. Japan is the largest importer of avocados in Asia, which are mostly supplied from Mexico while China is recording the highest growth rate for imports of avocados.

China has not been an importer of avocados until recently. In 2017 China imported 32,137 tonnes of avocados, which is up from under 100 tonnes since 2010, the report says. Consumption is negligible across the 1.4 billion population, although it is gaining awareness in more high-end areas where promotions are focused. Imports for China are sourced mostly from Chile (52%), Mexico (27%) and also Peru.

Singapore is a regular importer of avocados where Australia is a significant supplier. In 2017 Singapore imported 4,159 tonnes of avocados, which accounted for 108% of the country's total consumption since Singapore re-exported some 8% to other Asian destinations and has no local production. In 2017, Australia was the country's second major supplier, behind Mexico. However, Mexico is the fastest growing supplier for Singapore, currently supplying twice Australia's volume.

	2013	2014	2015	2016	2017	2017 share	5 year trend
	Tonnes	Tonnes	Tonnes	Tonnes	Tonnes	% of total	% p.a.
United States	571,827	729,142	867,364	751,750	900,186	42.1%	12.0%
Netherlands	143,604	168,762	187,336	241,505	267,332	12.5%	16.8%
France	100,259	119,726	116,373	134,360	145,813	6.8%	9.8%
United Kingdom	41,384	53,128	77,391	99,882	107,597	5.0%	27.0%
Germany	31,433	37,715	48,436	58,453	70,911	3.3%	22.6%
Spain	41,034	52,816	60,956	87,427	98,056	4.6%	24.3%
Canada	57,488	61,087	70,020	77,845	79,892	3.7%	8.6%
Japan	60,458	57,600	57,588	73,915	60,635	2.8%	0.1%
China	1,498	4,066	15,989	25,128	32,137	1.5%	115.2%
Belgium	15,077	16,595	20,050	29,302	28,374	1.3%	17.1%
Australia	10,941	19,889	15,214	19,757	16,407	0.8%	10.7%
all other	223,847	240,889	262,157	291,097	331,458	15.5%	
Total	1,298,850	1,561,415	1,798,874	1,890,421	2,138,798	100%	13.3%

Source: ITC Trade map; Fresh Intelligence analysis

Table 1

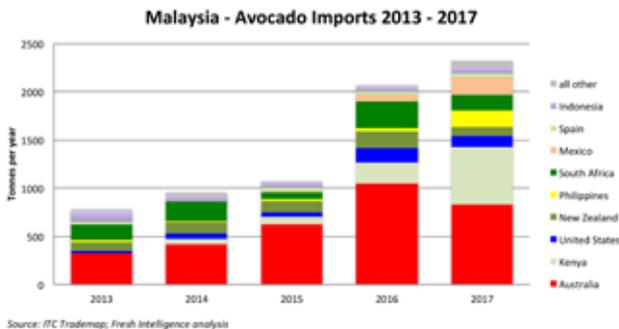


Figure 1

Malaysia is currently Australia’s largest export destination for avocados in Asia, according to the report (Figure 1). In 2017 Malaysia imported 2,327t of avocados, although per capita consumption remains very small at 0.07kg/person/year. Imports are sourced mostly from Australia (35%) and Kenya (26 %). Mexico has also entered the market and is likely to rise quickly.

In the Middle East, the largest importer is Saudi Arabia, with the bulk of supply from Kenya, Spain and South Africa. The country has no local production, but imports of avocado have been growing at 20.3%/year for the last five years, according to the report.

However, the interesting story is one of value: of the countries covered in this report, Australia sells into some of the higher value per kilogram markets. For example, the average price per kilogram in Kuwait is AU\$5.56/kg and for Singapore AU\$5.29/kg, with Australian fruit valued at \$9.19/kg and \$7.30/kg respectively. Given Australia’s high production costs, Australia, will never be a bulk exporter of avocados, instead focussing on delivering premium fruit, to high value markets.

Acknowledgements

These reports were prepared through the *Avocado industry and market data capture and analysis* (AV16006) project, funded by Hort Innovation, using the avocado industry research and development levy and contributions from the Australian Government.

More information

You can find the reports in the Best Practice Resource Library, at www.avocado.org.au/best-practice-resource/.



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Hail recovery a long term prospect



This orchard in Queensland's Maryborough area was hit by one of the severe hail storms that ravaged South East and Central Queensland in October, stripping crop, leaves and bark

Minimising secondary damage will be the key task facing orchardists in eastern growing areas, after devastating hail storms in October.

Queensland Department of Agriculture and Fisheries extension officer Simon Newett said as the storm season continued, it was important for all growers to be prepared for potential hail damage.

"Physical damage to trees lays them open to attack by fungi and insects that take advantage of the wounds, and the loss of canopy exposes the branches to severe sunburn damage," Mr Newett said.

"In the case of insects, tree wounds release chemicals such as ethylene that appear to act as magnets to some opportunistic insects such as borers."

For this reason, Mr Newett said it was a good idea to apply a fungicide and insecticide treatment.

"A registered avocado fungicide such as one of the coppers is suitable. The insects most likely to be attracted are borers of various types such as the auger beetle (*Xylopsocus gibbicollis*) and other ambrosia or pinhole borers."

The advice from Department of Agriculture and Fisheries (QDAF) Mareeba's Ian Newton and NSW Department of Primary Industries entomologists Craig Maddox and Ruth Huwer is to consider the registered insecticide chlorpyrifos, which is effective against beetles, or trichlorfon which will also be effective and treat spotting bug at the same time if you have fruit present.

"Once the borers are inside the tree it is too late so an application within a few days then a follow up perhaps a week or two later is suggested," Mr Newett said.

"The advice is to try and avoid using pyrethroids at this early stage of the season for their potential to result in a build-up of other insects such as scale.

"An azoxystrobin fungicide could be used instead of copper but shouldn't be applied at the same time as chlorpyrifos because of incompatibility.

"The other thing to take action on as soon as possible is sunburn protection. With branches exposed as a result of the loss of leaf cover some sort of sunblock such as white acrylic paint or a proprietary sunburn protection product should be applied to newly exposed branches especially on the northern and western aspects."

Mr Newett said these products could often be applied in diluted form through orchard sprayers but multiple applications may be necessary to get enough protection. To speed up the canopy re-growth you may also want to apply some extra nitrogen.

"With the loss of crop it does present an opportunity to carry out some canopy management, just remember to protect the newly exposed branches and trunks from sunburn before the fast approaching hot weather arrives," he said.

More information

If you have any queries or want to discuss your particular situation, please contact Simon Newett on 07 5381 1326, 0400 565 784 or simon.newett@daf.qld.gov.au.

Acknowledgements

Thanks to Chris Searle, Ian Newton (QDAF entomologist at Mareeba) and the NSW DPI entomologists Craig Maddox and Ruth Huwer for their advice.

New Best Practice resources

The industry Best Practice Resource (BPR) is a key component of the Avocados Australia industry website.

Avocados Australia CEO John Tyas said the new look BPR had certainly been popular with avocado industry members, from growers to retailers.

“In 2013/14, the website averaged 1,081 visitors per month but less than two years after the new website was introduced, the average number of visitors has more than doubled to 2,910,” he said.

“The complete refresh of the industry website was undertaken to ensure content is easily accessible, and that the highly valued content of the BPR easily navigated and frequently updated with the latest industry advice and research, as available.”

What’s new in the BPR

New global market reports

Two new global market reports have been added to the BPR Library, under the Export heading. You can read more about these reports on pages 25-26.

Nutrition review

A paper reviewing avocado nutrition can now be found in the Australian Agronomy section of the BPR Library. This review



AVOCADO PLANT NUTRITION REVIEW

Simon Newett, Peter Rigden and Bridie Carr
 Department of Agriculture and Fisheries, Nambour, Queensland
 August 2018






AUSTRALIAN AVOCADO SUPPLY CHAIN Best Practice Guide





paper, by Simon Newett, Peter Rigden and Bridie Carr from the Queensland Department of Agriculture and Fisheries (QDAF), includes results of a nutrition survey amongst Australian growers, a discussion by a number of agronomists of the results, information on recent nutrition research from around the world, typical practices from overseas and suggestions for future research.

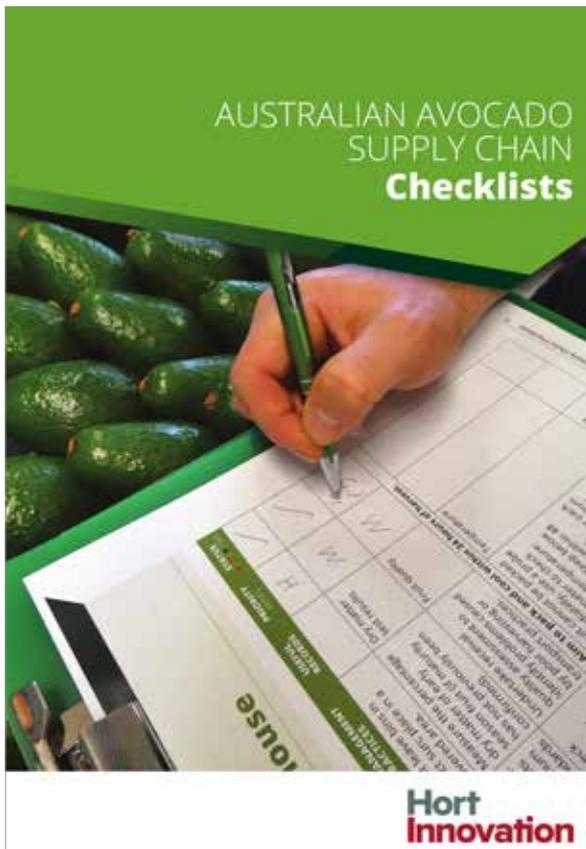
Event materials

Did you miss the 2018 Regional Meeting series or do you want to check out some of the presentations in more detail? Presentations from key presenters are now in the BPR Library in the Event Proceedings section. This includes Avocados Australia CEO John Tyas’ import and export overview, presentations from Applied Horticultural Research staff members on the new best practice guides and retail quality management (more on that below), and more on supply chain quality improvements from University of Queensland and QDAF.

Best practice guides

Exciting new resources have been developed for the avocado industry: *Avocado Best Practice Guide*, *Avocado Fruit Quality Problem Solver*, Avocado Supply Chain checklists (available in individual sections from pre-harvest to distribution), *Avocado stages of ripeness chart*, and the *Avocado Post-Harvest Review*.

New Best Practice resources continued



The aim of the supply chain-focused material is to increase awareness of the post-harvest factors affecting avocado quality, and ensure the supply of consistent, high-quality fruit to consumers. You can find the new resources at the top of the BPR Library's Education Materials section.

The files include downloadable and printable checklists by supply chain segment, including pre-harvest, harvest, packhouse, transport, ripening/wholesaler, and distribution centre.

Export

As Australian avocado volumes continue to grow, the development of export markets will become increasingly important to maintain profitability in the industry. The Export section of the BPR has been given a refresh, with updated information added to assist potential avocado exporters.

More information

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

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.

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Modern slavery laws drive transparency push in fresh produce chains

Jane Muller, Growcom

Worker exploitation – and, in some instances, forms of slavery – occur in many industries in Australia, including horticulture.

Governments at both state and Commonwealth levels have moved to address insidious forms of slavery, bonded labour and worker exploitation through the introduction of Modern Slavery laws.

In New South Wales, legislation has been enacted requiring entities with an annual turnover of \$50 million or more to publish a Modern Slavery Statement. These companies must also demonstrate actions to address risks of slavery or worker exploitation occurring within their company and their supply chains. Companies who fail to meet these requirements or provide misleading information face penalties of up to \$1.1 million.

A similar bill was introduced into Federal Parliament in June which, if passed, would apply to entities with an annual turnover of \$100 million.

Coles already participates in international modern slavery reporting frameworks and both Coles and Woolworths have adopted responsible or ethical sourcing policies.

Major players in the fresh produce industry, such as Perfection Fresh, Costas and the Fresh Produce Group, are large enough to be impacted by the New South Wales law.

The new laws mean that retailers and the larger fresh produce companies must have mechanisms in place to verify their suppliers' employment practices. In the short-term, direct suppliers are being requested to demonstrate their employment arrangements are legally compliant; however, in time, second and third tier suppliers will also face greater scrutiny.

The Fair Farms training and certification program will help growers meet emerging requirements for verification and transparency. The program moves into a "proof of concept" pilot phase in October. Up to ten farm businesses around Australia will help to test each of the key elements of the program.

Lessons learned from social and ethical audits in farm businesses

While scrutiny of employment practices on farms may seem new to many growers, direct suppliers to large companies such as McDonalds or Coles have needed to demonstrate compliance with social or ethical standards for some years now. During the last two years, audit firm AUS-QUAL has completed more than 1,000 social audits with farm businesses.

Terry O'Brien, AUS-QUAL's general manager of corporate services, has reviewed these audit results to identify matters

that commonly trigger corrective actions or findings. The most common include:

- safety and administration issues (60%)
- insufficient written policies and procedures (10%)
- harsh treatment of farm workers (7%)
- farm workers required to work excessive hours (6%)
- child labour or poor management of young workers/minors (6%).

Essential administrative matters that auditors check for include:

- written policies and procedures
- current certificates of insurance and licenses
- contracts, for example with labour hire agencies
- employment records, particularly for induction and training.

Health and safety matters that commonly trigger audit findings include:

- inadequate assessment of health and safety risks by farm managers (16%)
- poor emergency procedures and equipment
 - evacuation maps, signage, drills or training (22%)
 - nominated fire wardens, fire-fighting equipment or drills (15%)
 - qualified first aiders, first aid kits, or out of date first aid supplies (15%)
 - blocked emergency exits (7%)
- insufficient "tag & test" of electrical equipment.

It is worth conducting a review of these issues in your own business. While most are legal requirements, well managed health, safety, training and record keeping also helps build a positive business culture and high job satisfaction amongst staff.

More information

Further information regarding your obligations as an employer is available at fairwork.gov.au and growcom.com.au.

Acknowledgements

The Fair Farms Initiative is delivered by Growcom, in collaboration with industry and supply chain stakeholders. It is supported with seed funds from the Fair Work Ombudsman community engagement grants program.

Wage theft unacceptable

Growcom has condemned the mistreatment of migrant workers as described in recent reports, *Wage Theft in Australia and Wage Theft in Silence: Why Migrant Workers Do Not Recover Their Unpaid Wages in Australia*, published from the University of New South Wales, and the University of Technology Sydney.

Growcom Chief Advocate Rachel Mackenzie said there was an underbelly to the horticultural industry which hurt everyone, including those growers who do the right thing and were undercut by those who don't pay their workers properly.

"Wage theft in horticulture is real and it is not acceptable, however, we do need to remember that the figures quoted in this report are based on a self-selecting survey so are unlikely to be fully representative of the workers in this sector," Ms Mackenzie said.

"That said, even one case of wage theft is too many."

According to a release from the Migrant Worker Justice Initiative, few underpaid migrant workers ever take action to get the wages they were owed.

According to the Centre, the report found only 3% of underpaid participants contacted the Fair Work Ombudsman and well over half of them recovered none of their unpaid wages.

And, in the previous 2017 report, *Wage Theft in Australia: Findings from the National Temporary Migrant Work Survey*, also by Bassina Farbenblum and Laurie Berg, the Centre said underpayment was widespread across numerous industries, but especially common in food service, and fruit and vegetable picking.

The 2017 report, also based on a survey of workers, found almost one in seven participants working in fruit and vegetable-picking and farm work (15%) earned \$5 per hour or less. Almost a third (31%) earned \$10 per hour or less.

In October, Growcom began to pilot the national Fair Farms certification training, aiming to give growers the tools they need to treat their workers fairly as well as restoring confidence to customers and the wider community.

"The Fair Farms Initiative gives industry an opportunity to establish a practical market recognition scheme that enables farm businesses to demonstrate that their employment practices comply with Australian laws and industry standards," Ms Mackenzie said.

"Growcom has worked closely with state and national horticulture industry groups, retailers and supply chain stakeholders to ensure the initiative meets the needs of all industry members."

The Fair Farms certification scheme will offer:

- a code of practice that clearly outline what farm businesses must do to comply with employment laws and industry standards
- an online self-assessment against the code
- training options
- third party auditing and certification, if required.

"There is nothing we and our growers want more than to have a reliable workforce and for that workforce to be ethically and fairly employed," Ms Mackenzie said.

"There are enough challenges around securing a workforce for our growers, particularly during peak times, without the added weight of stories which reflect poorly on our industry."

More information

Read more about Fair Farms on page 30.



Take care in the orchard

Workplace health and safety in the orchard is a year-round job.

Avocados Australia has included a range of resources in the Best Practice Resource (BPR), specifically developed for the avocado industry.

Recent news out of Queensland highlights the need for care to be taken every day, after a macadamia orchard worker had his arm partially amputated when the quad bike he was operating collided with a mechanical pruner.

Workplace Health and Safety Queensland reports one worker was operating a mechanical pruner attached to the front of a tractor to prune the bottom branches from macadamia trees. Another worker was operating a quad bike nearby and the quad bike and its operator contacted the pruner resulting in a partial arm amputation. Investigations are continuing.

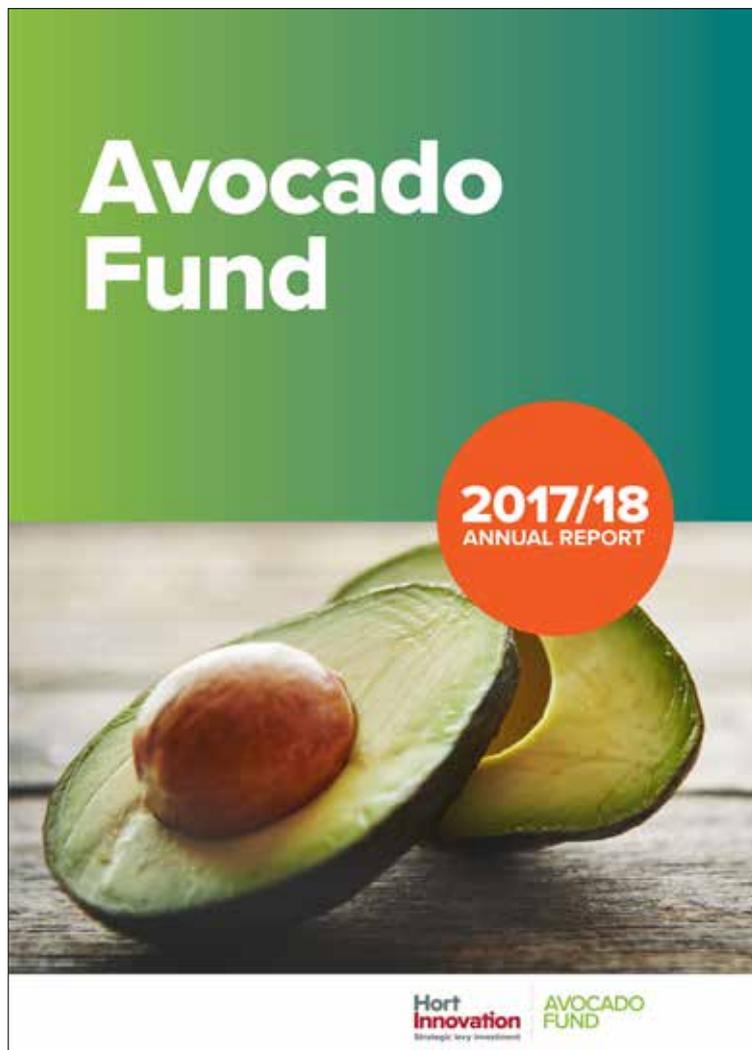
This incident occurred just weeks after another fatal incident in Queensland where a property owner on a quad bike collided with the back of a stationary trailer. He then managed to walk approximately 150m to a tractor and start driving it, but lost control and drove it down an embankment covered with long grass.

According to Workplace Health and Safety Queensland, quad bikes have become very popular farm vehicles in recent years, due to their adaptability, low running cost and easy operation. Safe operation of quad bikes is essential in all situations, or they can be very dangerous.

On steep terrain or when driven at speed, quad bikes can be very unstable due to their light weight and high centre of gravity.

More information

Visit the WHS section of the Best Practice Resource, www.avocado.org.au/best-practice-resource/ for a range of guides, induction materials, hazard checklists and management tools.



Hort Innovation Avocado Fund report

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Each industry-specific report includes key investment and project information from 2017/18; the avocado fund report is available at <http://bit.ly/TA293AVFUND>.

If you prefer to read a hard copy of your industry's annual report, you can use the form available through the portal (<http://bit.ly/TA293HORT>) to place an order and have your report mailed to you.

And if you'd like to get closer to what your levy is achieving throughout the year, remember to sign up to Hort Innovation's free membership program at www.horticulture.com.au/membership.

CEO of Hort Innovation attends board meeting

The new CEO of Hort Innovation, Matt Brand, attended the Avocados Australia board meeting in early November, discussing his proposed approach to managing the company.

Mr Brand (pictured with Avocados Australia Chair Jim Kochi) joined Hort Innovation in early September. Most recently, he was the long-term CEO of NSW Farmers, Australia's largest state farmer organisation. In this role, he drove a strategic, structural and cultural change agenda within NSW Farmers.

He has also held senior marketing, commercial and sponsorship roles in the 'fast-moving consumer goods' industry and professional sport, and is a member of the Australian Institute of Company Directors.

Speaking to industry representatives at a Hort Connections networking event held during Asia Fruit Logistica in Hong Kong, Mr Brand said horticulture was an industry with huge opportunities, particularly as Australia worked to take agriculture generally to a \$100 billion industry.

"In my first 100 days I will be out there visiting, talking to (industry)," he said. "I'm looking forward to working with industry representative bodies, growers, supply chain, to really help drive farmgate profitability and to really help contribute towards that \$100 billion goal for agriculture, including horticulture."



CEO of Hort Innovation, Matt Brand, with Avocados Australia Chair Jim Kochi

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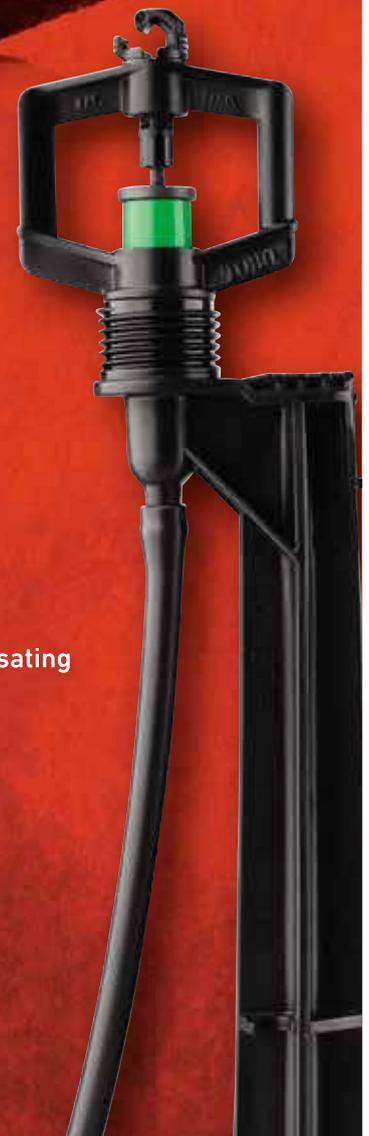
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Emerging Leaders Scholarship Available

Women who are current and emerging leaders in the Australian horticulture industry can now apply for a leadership development scholarship valued up to \$10,941.

Funded by Hort Innovation and Women & Leadership Australia (WLA), the scholarship grants cover up to 60% of the cost of the training programs.

Hort Innovation Chief Executive Officer Matt Brand said the gender disparity within the agriculture industry was well recognised, and Hort Innovation was proudly supporting a new era of gender equality and integration across industry through strategic levy investment.

“Through the Hort Frontiers Leadership Fund, we have already seen 12 women undertake the Masterclass in Horticultural Business training, with five graduations in the last round,” Mr Brand said.

“Our partnership program with WLA has already seen 11 successful graduates from the Women in Leadership Project, with another three scholarship recipients currently enrolled.”

Program Director at WLA Suzi Finkelstein said she was delighted to be carrying this grant program on into its second year.

“Women working in the horticulture sector, or any sector for that matter, deserve to be given every opportunity to excel and take on leadership roles, particularly in industries that are traditionally male dominated and that have significant gender pay gaps,” she said.



“Studies show that the more women you have in leadership roles in workplaces and industries, the lower the gender pay gap is for that workplace. Even though this developmental program is only in its second year, I know that we are making a positive and tangible difference to the sector.”

Scholarship recipient in the last round, Mardee Cassin, said her participation in the Accelerated Leadership Performance Program helped her to gain practical tools to develop and further progress her professional career.

“I am now more confident in communicating and working with a broad range of people, both within my current workplace and beyond,” she said.

Course information

Scholarship applicants can choose from three courses: The Accelerated Leadership Performance Program, the Executive Ready Program and the Advanced Leadership Program. The blended courses are delivered on a part-time basis over four, seven or 12 months respectively.

Participants will learn skills such as heightened presence and influence, managing team dynamics, driving performance and leading innovation and change.

Applications close

The funding is available to individuals and groups of employees who own or work within businesses that pay a levy to Hort Innovation. For more information and to apply, visit www.wla.edu.au/horticulture. Expressions of interest close on Friday, 14 December at 5pm AEDT.

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LEADing participants

Avocado industry members from across the country have been part of the first round of Leadership Exploration and Development (LEAD) program activities.

LEAD is a collaboration of Australian tropical fruit industries – avocado, melon, pineapple, banana, passionfruit, strawberry, persimmon, mango and lychee.

Growers and industry members from across the tropical fruit industries are being given a chance to develop their skills in leading their industries and their own businesses as part of this program.

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.

“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.”

Avocado industry participants include Keyalah Hennessey and Jake Binney from Central New South Wales, Moo Price from Sunshine Coast, Steve Marshall from Victoria and Kate Crook from Central Queensland.

Group 1 (pictured) has now completed their workshops, with Group 2 soon to start.

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.



Above: Group 1 LEAD participants at the Brisbane Markets.

Below: Group 1 during the first workshop for the 2018 LEAD project.





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Avocado festival success



Alvin the Avocado had his usual great time at the Blackbutt Avocado Festival, taking part in the street parade, meeting and greeting the visitors, dancing and generally enjoying himself.

It was all hands on deck for the 2018 Blackbutt Avocado Festival, with organisers happy to see a growing crowd for the 8 September event.

Bloomin' Beautiful Blackbutt Festival's Jeff Connor said more than 4,000 people visited the Queensland town for the third annual avocado festival.

Western Australian avo celebrations

The next celebration of all things avocado will be in Araluen, Western Australia in November.

All avocado enthusiasts are invited to the Perth Hills event, at the Araluen Botanic Gardens on November 24-25.

The festival will celebrate all things avocado including stallholders selling fresh produce, products from skin and beauty care to delicious beers and cocktails and chefs demonstrating how to make avocado creations at home.

There will be live music entertainment, fun activities for the kids, and horticulturalists on hand to provide advice for backyard growers.

Find out more here: www.araluenbotanicpark.com.au/araluens-avocado-festival-2018/.



Judge Kathy Duff with winner of the Avocado Costume Competition, Les Lane.

"The shower of rain at the start of the day had us a little concerned but the clouds broke and the sun shone through on what has become a record day for our festival," Jeff said.

Avocados Australia sent along Alvin the Avocado, and he had a great time at the street parade, checking into all the events (we tell of someone letting Alvin have his own team of huskies and a sled!) and meeting and greeting visitors.

The event is held on the second Saturday in September each year. Visit www.avofest.com.au for more information.



Sponsor of the Avocado strongman, strongwoman, juggling and golf competitions, Anthony Beutel (centre) with winners of the Avocado Strongman Competition.



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Nature's Fruit celebrates

Rod Kippen, Natures Fruit Co

Natures Fruit Company celebrated an important milestone in May this year: the national avocado packer and marketer's 30th anniversary.

Natures' story traces back to 1987 when 15 avocado growers from the Sunshine Coast hinterland rallied together to address problems growers faced when marketing their fruit. It was soon realised that the need for marketing support was a mutually shared vision.

Soon after that initial meeting, a Steering Committee was established to integrate the growers into a strong marketing force. On 11 December 1987 the trading entity 'Sunshine Coast Fruit Marketing Co-operative Association Limited' was registered.

Soon after, the inaugural General Meeting of the new Cooperative was convened on 28 January 1988. Nominations for Directors' positions were sought, and the election of officers was duly conducted.

The Board appointed Brian Capamagian as General Manager from 1 February and a team of support staff was recruited in preparation for the start of the 1988 season.

At this point, support for the Cooperative had swelled to a membership of more than 70 financially committed growers.

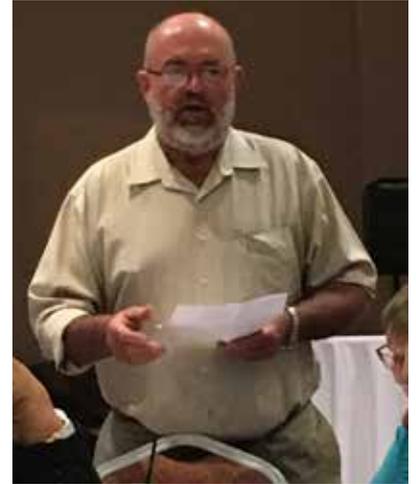
The business was to soon articulate its clear and definitive objective: "To obtain for the grower the highest possible nett return on fruit marketed over the season."

Whilst the initial concept was to use the clout of their collective fruit volume to leverage best price from the market, management recognised the need to establish a brand identity that would help to distinguish their product and create a quality image for it.

This was somewhat radical thinking in those days as product quality was commonly stated in generic terms such as "Premium", "First Grade" and so on. Using a brand to differentiate quality was an innovative step, 'outside the box' for fresh produce.

The brand name and visual identity for 'Natures Reserve' was launched, in the unmistakable 'pink box'.

Putting marketing matters aside, attention soon turned to establishing a packing facility as it was generally acknowledged that this would allow growers to focus on producing quality fruit.



Past Director of Natures Fruit Company, Rod Dalton

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- Are supplied with **packout information within 24 hours** and return estimates every Wednesday for fruit received in the previous pool week
- **Payments are guaranteed** through insurance against potential bad debts

...ISN'T IT TIME YOU CAME ON BOARD?

On 1 March 1988, packing operations started in a local transport warehouse and relocated the following year to customised premises at Nambour.

The business continued to grow with membership extending throughout Queensland and across state boundaries to the South and to the West.

Due to cooperative regulations varying from state to state and the administrative difficulties this caused, it was decided in 2002 to incorporate the business as The Fruit Company Limited (trading as Natures Fruit Company). The unlisted public company was to have a constitution that reflected the mutuality rules of the cooperative it replaced.

As the business continued to grow the Board decided to acquire land at Glasshouse Mountains and build a modern purpose-designed packing and administration facility. The Company's operations relocated to the new premises in November 2007 where the company has resided since.

Throughout the past 30 years the company has experienced the normal ups and downs of doing business, particularly the mixed fortunes associated with the land. From unfavourable weather events to over-supply crippling grower returns, to boom times when all seemed to fall into place, Natures has prevailed and triumphed as cause for celebration ... though only the good times seemed to be top-of-mind of the many dinner guests.

In his welcoming address at the special May 2018 event, Chairman John Tannock briefly recalled some landmarks of the Company's 30-year history.

On referring to the Company's early days and the first season in 1988, John acknowledged the presence of the inaugural General Manager Brian Capamagian and his wife Susan.

John extended a special welcome to Robert Price, Avocados Australia Limited (AAL) Director for the Sunshine Coast and introduced guest speaker for the night, former Chairman of AAGF and AAL, and past Director of Natures Fruit Company, Rod Dalton.

Rod recalled many of his experiences in the industry, anecdotes of humorous situations and some of the more serious reminiscences of his more notable achievements.

Not without its struggles and its success stories, Natures had endured the good with the bad, strengthened for another 30 years.



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Producing better fruit by innovation

Hort Innovation Marketing Update

Welcome to the Avocado Spring 2018 marketing update. This activity is managed by Hort Innovation on behalf of the industry and is funded by the avocado marketing levy.

This has been a pivotal period for Australian Avocados, with the Smash an Avo creative commencing its second burst of advertising into financial year 2018/19.

Following success within the first burst of the campaign, the new creative and a new logo was well received with the industry's target demographic. To ensure the media was used to maximum advantage within the second burst, high impact media formats such as television and Out of Home (OOH), social, and online video and display channels were used to effectively engage the demographic.

Television

The Australian Avocados television campaign launched on 9 September into a strong programming slate. The goal is to reach 35% of the target audience (Grocery Buyers aged 25-54) at least twice with this ad, across all Metro markets and regional markets in New South Wales, Queensland and Victoria. The campaign period was across a total of two months with five live weeks within that time period.

To launch the second burst of television activity, Australian Avocados secured spots within the networks' tentpole programming including *The Bachelor Australia*, which was averaging over 800,000 total viewers per episode, *The Block*, which had a huge success with a regular audience of over one million tuning in, and *Australian Survivor*, with an audience averaging over 700,000 each episode. These major programmes were bolstered by the networks' news and current affairs programming, with Subscription Television (Foxtel) providing incremental reach across all the markets.

Digital

Supporting our television buy, Australian Avocados ran digital activity during the months of August and September. The strategy consisted of Australian Avocados' standard 15 and 30 second video ads across catch up television, YouTube six-second bumpers as well as a Spotify 15 second audio spot. All channels achieved above bench mark results during the campaign period.

The catch-up television strategy finished with an overall completion rate of 92% and a viewability rate of 80% while serving out more than 974,000 impressions. Spotify had an audio completion rate of 88% across more than 160,000 impressions, and impressively, YouTube served more than 2,290,000 impressions with a 92% completion rate.

This campaign has delivered well beyond its designated benchmarks through careful planning and strategic up weighting of channels and strategies to current digital trends such as popular catch up television shows such as *The Bachelor Australia*, *The Block* and *Australian Survivor*, as well as live

events such as NRL Final Series which was broadcast live and free on the 9Now app.

Definitions of some of the common digital terms are:

Completion Rate - The percentage of all video ads that play through their entire duration to completion. Calculated as complete video plays divided by ads served.

Viewability - An online advertising metric that aims to track only impressions that can actually be seen by users. For example, if an ad is loaded at the bottom of a webpage but a user doesn't scroll down far enough to see it, that impression would not be deemed viewable.

Impression - An impression is the display of an ad to a user while viewing a web page. If a single web page contains multiple advertisements from one advertiser, one impression is counted for each ad displayed.



OOH Gyms

To drive frequency across our demographic, we extended our screen reach into both Anytime Fitness and Fitness First gyms as well as Fitness First Magazine. Our ad appeared on panels in a total of 260 gyms with more than 2.7 million member visits within the campaign duration. The screens served out more than 7.4 million impressions. Our TVC also appeared on screen within the Anytime Fitness TV Network across 300 gyms. This had more than 2.3 million-member visits, with more than 300,000 spots played.

Across Fitness First gyms, the campaign had 1822 Landscape TVs with a total of more than 68,000 delivered playouts, reaching more than 5,270,000 gym users with a frequency of 2.4 visits across July. Australian Avocados also received, as bonus, a full-page ad in the July/August issue of Fitness First magazine and a one-page editorial piece focused on why avocados are a necessity in your nutrition. This magazine is circulated within 60



OOH Retail

Out of Home digital shopping centre screens are important to the campaign as the last point of contact for advertising to communicate to the shopper before the purchasing decision is made. This form of advertising reinforces the message in consumers' minds and helps to drive action before consumers enter the grocery store and is a critical step for the path to purchase journey. The OOH activity included three pieces of creative featuring three different meal ideas being run on TV screens located at select shopping centres across Australia to inspire consumers while grocery shopping.

Australian Avocados were booked on a total of 336 screens nationwide from 5 August to 22 September, across a variety of shopping centres (through Val Morgan Outdoor) targeting Grocery Buyers 25-54.

The reach of this activity was huge with Val Morgan outdoor activity reaching more than three million people on average of 5.3 times. These results were achieved across 48 paid HD screens and five bonus screens per week across the seven-week campaign. These placements were crucial as a last point of contact for the buyers as this is one of the last interactions on their path to purchase.

Social Media

The Australian Avocados consumer-facing social media has been running on an always on schedule, with a post going live 1-2 times a week to continue to keep Australian Avocados in the front of consumers' minds. Since July more than 800,000 individual consumers have been shown Australian Avocados content, with the aim to inspire and educate. An example of this is the post below, encouraging consumers to correctly check for ripeness. This post alone was seen by more than 171,000 people.

Current content strategy aims to drive engagement, so that consumers can develop meaningful interactions with the Avocados Facebook page and keep avocados at the front of their mind while shopping. In August alone, there was more than 40,000 engagements (reactions, comments, shares, photo views and link clicks) across both Instagram and Facebook, showing that the content is engaging with fans.



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PR

The key component of the current PR campaign was the 25th anniversary of the quintessential Aussie favourite, Avo Toast.

Iconic Aussie restaurateur Bill Granger first put avocado on a piece of toast and served it at his café in Sydney’s Darlinghurst back in 1993. Not only did he launch ‘brunch’ as we now know it, but he also sparked Australia’s great love affair with the versatile fruit.



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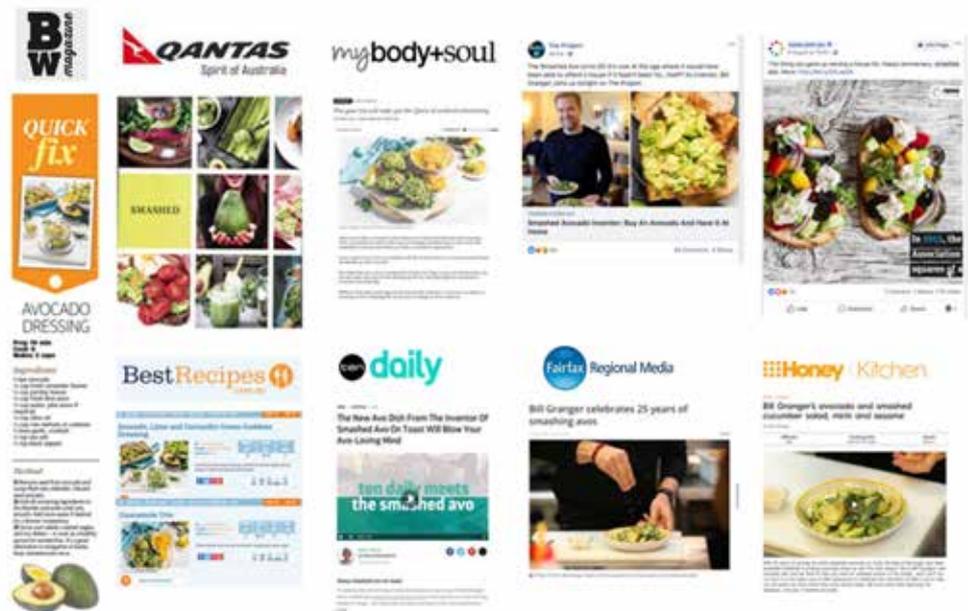
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Hort Innovation Marketing update continued

To help Australians celebrate the 25-year milestone, the 'father of smashed avo' shared his fresh, new avocado go-to dish for 2018 – avocado and smashed cucumber salad with mirin and sesame. Hort Innovation also worked closely with Avocados Australia to develop the 25-years timeline, qualifying consumption growth and plantings, with Tamborine/ Northern Rivers grower Tom Silver supporting the campaign to provide the growers' perspective. This timeline was used across social media and PR to support the 25th anniversary messaging. Three new exclusive recipes were also developed and shot to offer to media as ongoing content. The recipes were developed to showcase the versatility of avocados.

Two top tier outlets (*Ten Daily* and *Nine Kitchen*) were invited to an exclusive unveiling and interview opportunity with Bill at his new restaurant in Sydney, and the timeline and new recipes were pitched to other media.



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So far there have been 83 pieces of media and social coverage, reaching an estimated 11.9 million. Highlights include:

- *Nine Kitchen* video and article (<http://bit.ly/TA293BILL>) and *Nine Kitchen* podcast (<http://bit.ly/TA293POD>)
- *Ten Daily* coverage (<http://bit.ly/TA293AVO>) which extended across social channels, with *The Project* also sharing the news on Facebook and Twitter, and
- a *news.com.au* video.

Myfoodbook

The current subscription with Myfoodbook has now been active for a year, and in that time, avocado recipes have proven extremely popular. In total, consumers have viewed avocado recipes more than 220,000 times. Avocados were also featured in two seasonal cookbooks, *Good For You Foodbook* and *Global Favourites Foodbook*. These have been downloaded more than 20,000 times. You can find and download the *Global Favourites* here: <https://bit.ly/2RAeEhm>, or visit Myfoodbook.com.

Acknowledgement

This activity is managed by Hort Innovation on behalf of the industry and is funded by the avocado marketing levy.

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Water use efficiency

Shane Singh & Liz Singh, AgriHort Solutions

Avocado trees have a high demand for water all year round and are sensitive to changes in soil moisture. Water is a limiting factor in many Australian avocado orchards making decisions surrounding when and how much to water for the best cropping results critical.

Avocados can survive under various climatic conditions, however, in dry hot climates the need for extra water for cooling (misting) purposes puts additional stress on the use of this limited commodity. The trees have shallow root systems without the root hair adaptation of other horticultural crops limiting their ability to search for water in dry times and are particular sensitivity to salt toxicity.

It is relatively easy to calculate your orchard's daily water use or to develop annual water budgets (*Box 1 - Crop water use calculations*) using Evapotranspiration - (ETo) and a crop coefficient (Kc). The use of soil moisture monitoring equipment is essential for understanding changes in soil moisture in relation to your rootzone (*Box 2 - Monitoring moisture*).

This information, however, does not examine orchard yield water use efficiency (number of tonnes of fruit produced per 1ML of water used), water use of different variety/rootstock combinations or water volumes used for growth stages. The collection of regional water use data is required to take the next step in improving water use efficiency in Australian avocado orchards.

A regional study conducted in the wine grape industry has produced results that could be transferred to the avocado industry with a little interest from growers. The study (accessible at <http://bit.ly/TA293WUE>) collected irrigation information from growers for different variety/rootstock/irrigation combinations and calculated yield water use efficiencies (*Figure 1*) and water use for specified growth stages (*Figure 2*).

Figure 1: The range of Yield WUE values (t/ML) for vineyards in the Murray Valley in season 2012/13. Source: Assessing Yield Water Use Efficiency (WUE) in the Murray Valley and Riverina Regions Season 2012/13, <http://bit.ly/TA293WUE>

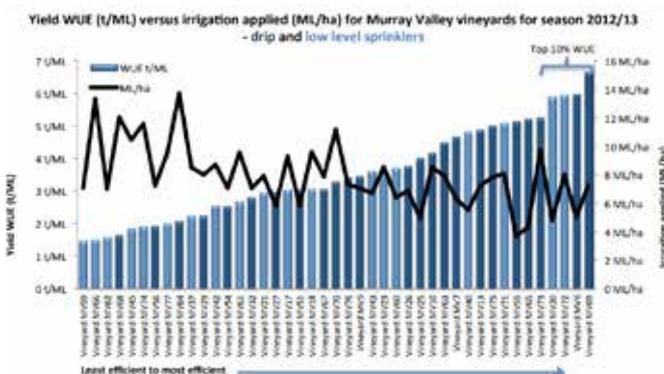
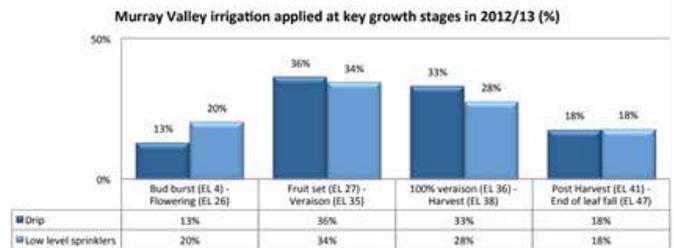


Figure 2: Average irrigation applied at key wine grape growth stages (%) in the Murray Valley. Source: Assessing Yield Water Use Efficiency (WUE) in the Murray Valley and Riverina Regions Season 2012/13, <http://bit.ly/TA293WUE>



Avocado's turn?

Funding is not readily available to collect regional data, yet regional data can provide the knowledge required to make significant improvements in best practice management.

AgriHort Solutions is looking for growers who would be interested in comparing their water use efficiency with others in industry. Are you one of them? We will supply our time free of charge to collate irrigation data.

Your commitment would be to purchase and install a water flow meter, provide some production details and report the meter readings at specific times of the year. (We can organise the meter and send it out to you.)

We suggest you start with one block on your property and let's see what information we can collect. All data will be kept strictly confidential.

Cost? We estimate that the meter will cost you \$250 plus postage. It is not a big capital cost, but it could provide some very valuable information.

Contact Liz at liz@agrihort.com.au to start understanding water use efficiency in your avocados and critical water use timings in the growth cycle to improve your water management today.

To access evapotranspiration data for your region, go to the Bureau of Metrology (BOM) website - www.bom.gov.au/wat/eto/ - and select the weather station closest to your orchard or for monthly climate statistics looking at long-term means - www.bom.gov.au/climate/data/index.shtml.

The Food and Agriculture Organization (FOA) has determined crop coefficients for many crops and can be found at www.fao.org/docrep/X0490E/x0490e0b.htm. The crop factors for avocados with no groundcover are listed *Table 1* and have been adjusted for by AgriHort Solutions to account ground cover, tree height, climate and growth stage in *Table 2*.

Figure A illustrates daily avocado crop water use for the Bundaberg region using:

- Series 1 - the long-term evapotranspiration figures provided by BOM, and the crop coefficients in *Table 2*. No rainfall has been accounted for in this calculation and

- Series 2 – the calculations for the 2017/18 year which experienced wet weather conditions in October and February. While a surplus of moisture was recorded for these months, the excessive rainfall events happened within a few days and irrigation still may have been required, making the result deceiving.

Considerations for the use of this calculation include:

- data is relative, based on weather stations that are the closest to your orchard,

- weather station data is not always complete,
- there is no way to account for effective rainfall or excessive runoff.

Crop water use calculations

Crop water use (mm) = Evapotranspiration (ETo)(mm) X Crop Factor or Co-efficient – rainfall (mm)

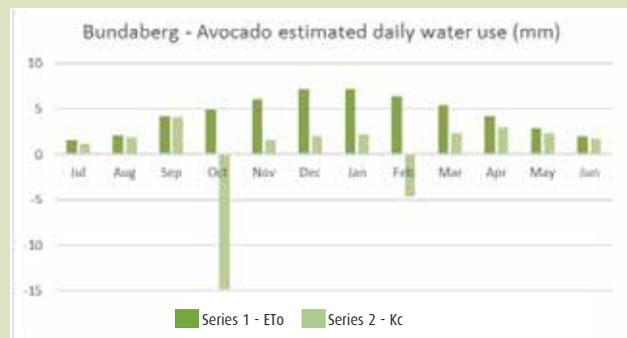
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Figure A: Crop Water Use calculation using ETo and Kc – Bundaberg - Avocados



Considerations for the use of this calculation include:

- data is relative, based on weather stations that are the closest to your orchard,
- weather station data is not always complete,
- there is no way to account for effective rainfall or excessive runoff.

A free app developed by The Yield (<https://itunes.apple.com/au/app/the-yield/id1154809498?mt=8>) is making evapotranspiration data easier to access and is providing a seven day forecast for interested growers.

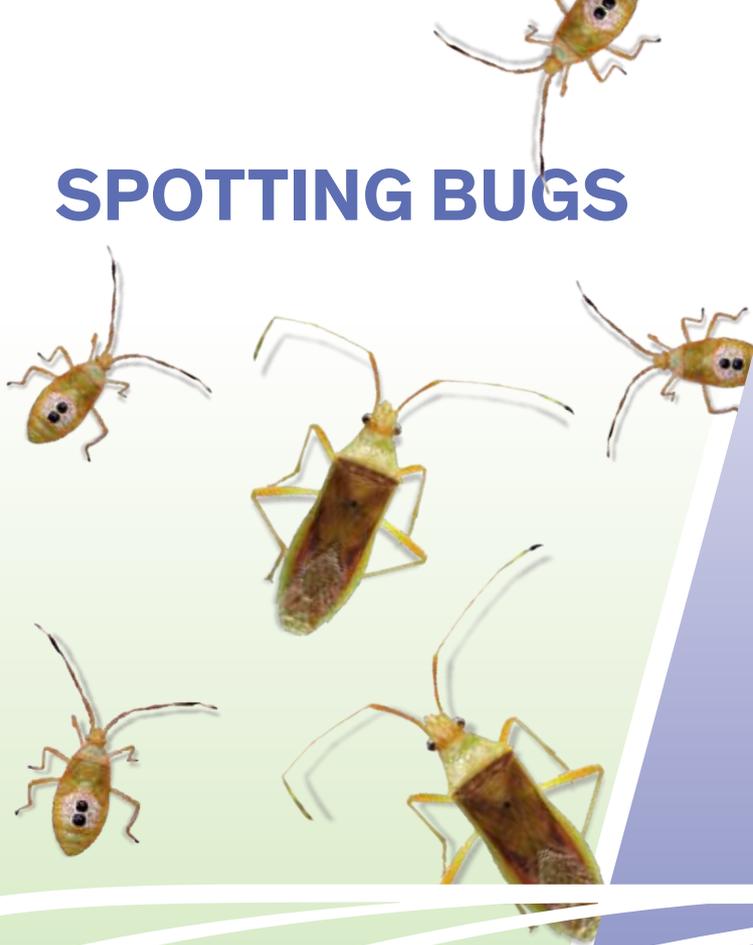
Table 1: FAO avocado crop factors

Crop	K _c initial	K _c mid	K _c end	Maximum Crop Height (h) (m)
Avocado, no ground cover	0.6	0.85	0.75	3

Table 2: AgriHort crop factor estimations

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
AgriHort Crop Factor Estimation	0.5	0.5	0.8	0.8	0.9	1	1	1	0.9	0.9	0.8	0.7

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Water use efficiency continued

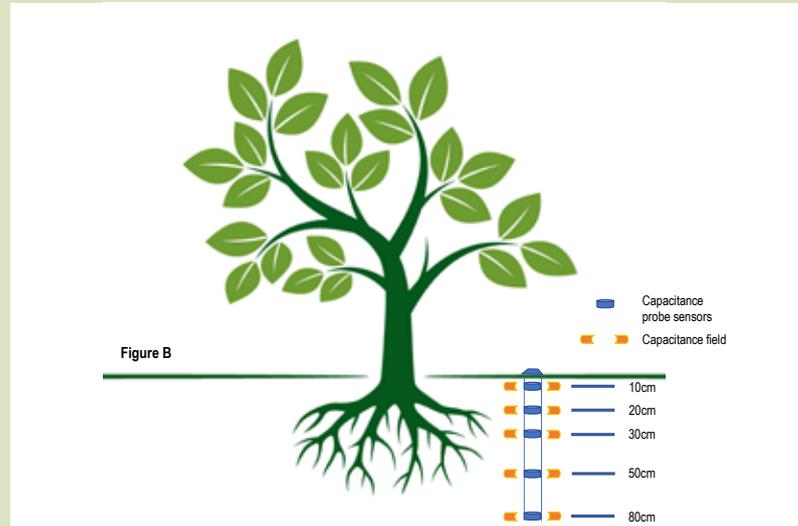
Monitoring Moisture – Capacitance Probes

Monitoring soil moisture is critical to irrigation success! Understanding tree water requirements and ensuring efficient water use without wastage is vital for limited water resources. It is important to invest in soil moisture monitoring equipment that can supply timely information about soil moisture levels.

If you are serious about water use efficiency in your orchard, capacitance probes are an excellent tool. This is the expensive end of the monitoring equipment market and certainly other options are available, but the information capacitance probes can provide over less technical models is a long-term investment in your orchard’s sustainability.

Capacitance probes have sensors at different depths determined by you, though generally in the upper, middle and lower rootzone areas with an extra sensor located under the rootzone to examine water leaching (*Figure B*). Capacitance probes measure soil moisture in either mm or %. The probes in layman’s terms use electrical pulses plus maths to determine water content of the soil and real

Figure B- Capacitance probes measure soil moisture in either mm or %



time data can be relayed to the web or to your computer.

The ability to access moisture levels at various depth on demand provides the opportunity for timely and accurate irrigation decisions. *Figure C* shows the changes in soil moisture at different depths and *Figure D* illustrates how this data can be used to calculate optimal soil moisture ranges for your orchard.

If your orchard is irrigated or irrigation installation is imminent, investigate your options of soil moisture monitoring equipment and invest. The power of information at your fingertips can equal dollars in your pocket.

Note: Correct installation of capacitance probes is required. Air gaps around the sensor can lead to large errors.

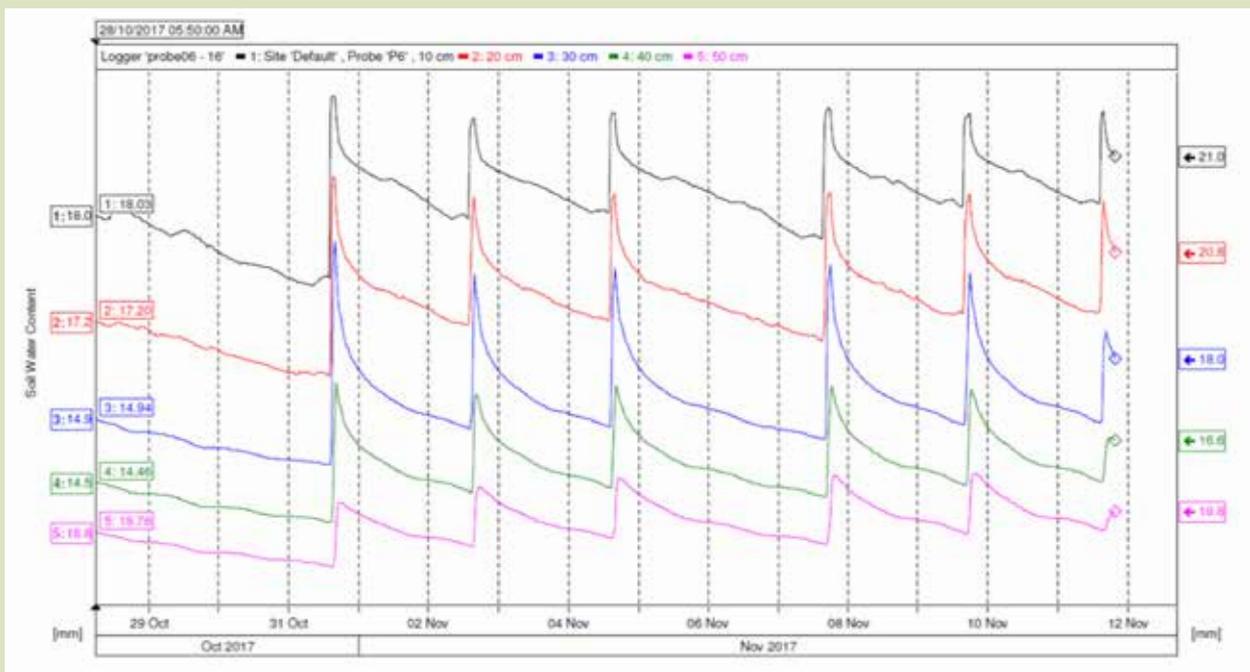


Figure C - Changes in soil moisture at different depths

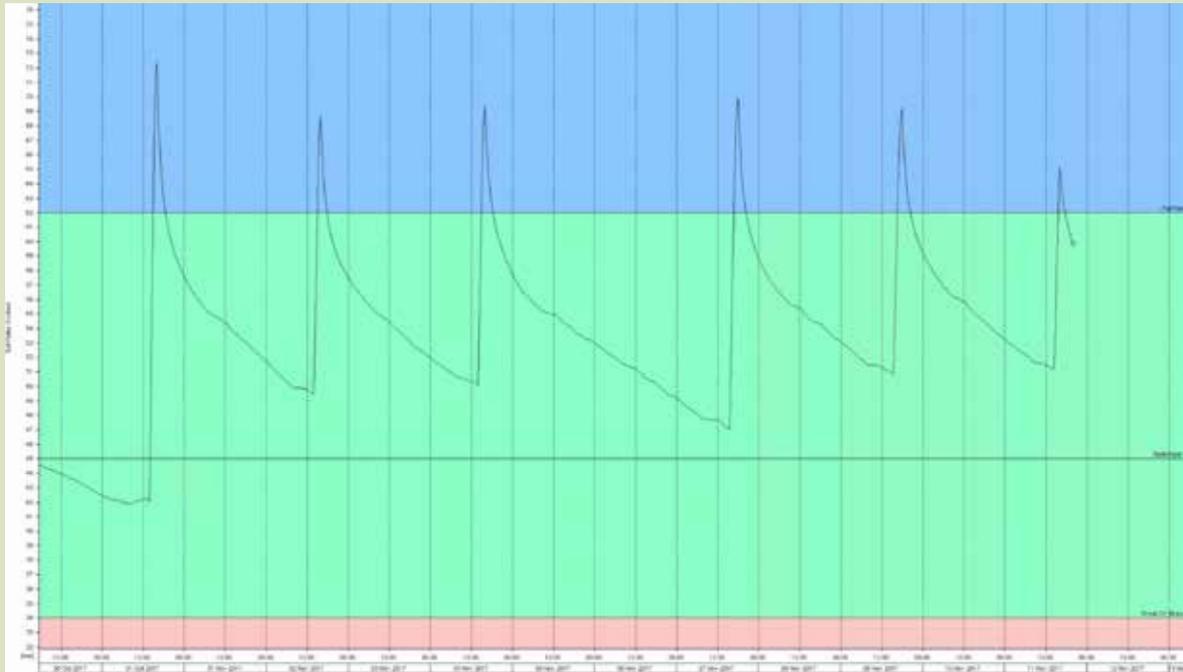


Figure D - The X axis in this sample shows both the day and time of day, the Y axis is soil water ranging from 32 (stress point) to 76 (full profile). Soil moisture ranges; Blue - full profile, Green - available water zone, Red - stress point.

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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

Avocado fertilisation: matching the periodic demand for nutrients

Israel (2018): The main objective of this study was to assess the seasonal nutrients requirement of Hass trees grown in lysimeters. The beneficial effect of early fertigation on fruit yield was statistically significant, mostly because of higher fruit number. Leaf analyses are commonly used in the avocado industry as a guide for fertilisation yet; fruits rather than leaves are the main products of avocado orchards. Based on fruit growth data and nutrient concentration in the fruit, the N, P and K quantities removed by Hass fruit yield of 30t ha⁻¹ were 120, 25 and 240kg ha⁻¹. Taking into account common efficiency consideration (nutrient quantities removed by fruit yield divided by quantities added), the annual quantities of N, P and K required for attaining high quality avocado yield are 250-300, 80-120 and 500-600kg ha⁻¹, respectively.

Pests and diseases

Vertical distribution and daily flight of ambrosia beetles

USA (2018): Ambrosia beetles have emerged as significant pests of avocado due to their association with pathogenic fungal symbionts, most notably *Raffaelea lauricola*. Results suggest that ambrosia beetles in South Florida fly near sunset (when light intensity and wind speed decrease) at much greater heights than previously assumed and have species-specific patterns in host-seeking flight.

PSHB and its fungal symbiont: a new invasion in South Africa

South Africa (2018): The polyphagous shot hole borer (PSHB), an ambrosia beetle (*Coleoptera: Curculionidae: Scolytinae*) native to Asia, together with its fungal symbiont *Fusarium euwallaceae*, has emerged as an important invasive pest killing avocado and other trees in Israel and the United States. During routine surveys of tree health in botanical gardens of South Africa undertaken as part of a sentinel project, an ambrosia beetle/fungal associate was detected damaging London Plane. This is the first report of PSHB and its fungal symbiont causing Fusarium dieback in South Africa. This report also represents the first verified case of a damaging invasive forest pest detected in a sentinel planting project, highlighting the importance of such studies.

First report of white root rot in South Africa

South Africa (2018): In September 2016, rapidly declining avocado trees (grafted on *Phytophthora cinnamomi*-tolerant rootstocks) were observed in orchards. Aboveground symptoms included leaf yellowing and wilting. In severe cases, the entire tree became brown and necrotic, resulting in death within a few weeks. Dark brown lesions were present at the base of the trunk, with white mycelial strands extending under the bark. Infected roots were necrotic and covered with a fine layer of mycelia. White shoestring mycelia were present in the surrounding soil. The causal pathogen was isolated and identified as *Rosellinia necatrix*. This is thought to be the first report of white root rot caused by *R. necatrix* on avocado in South Africa.

Alternative approach to control stem-end rot in avocado cultivars

South Africa (2018): Stem-end rot is a postharvest disease associated with multiple important fungal pathogens including *Lasiodiplodia theobromae*. This study investigated the antifungal



activities of selected natural plant volatiles (vapour phase): citral, octanal, hexanal and thymol against *L. theobromae* (causal pathogen of stem-end rot) in vitro and in vivo in Hass and Fuerte avocados. Hexanal showed a lower inhibitory effect on the radial mycelial growth of *L. theobromae* in vitro. However, citral at a minimum concentration of 4µl/L revealed fungicidal activity and completely inhibited the spore germination of *L. theobromae*. Artificially inoculated Hass and Fuerte avocados with *L. theobromae* were exposed to citral (768µl) and commercial fungicide prochloraz and stored for six days at 20°C and 14 days at 10°C separately and thereafter held at 20°C for three days to simulate the retail shelf conditions. Although citral in a volatile phase effectively reduced the development of stem-end rot in both cultivars, its effect was significant in Fuerte with 75% reduction in the incidence of stem-end rot. The biochemical analysis demonstrated an increase in total phenol contents, phenylalanine ammonia-lyase, chitinase and β-1, 3 glucanase activity in fruit exposed to citral when compared to the reference treatment prochloraz and the untreated control for both cultivars. Furthermore, fruits exposed to citral retained the ready-to-eat firmness and therefore could be considered a potential alternative treatment to control stem-end rot at the post-harvest stage.

Post-harvest

Evaluating the performance of SCiOTM

New Zealand (2018): In this work, a low-cost portable near infrared spectroscopy (NIR) sensor, SCiOTM molecular sensor, is assessed for its ability to provide quality information. Avocado samples were collected and their spectral and quality measurements obtained in order to develop NIR predictive models. The SCiOTM sensor was moderately successfully in the classification of ripeness stages of Hass avocado, with good repeatability in model validation (β50-70% validation accuracy).

Variation in the fatty acid profile of Hass preserved during cold storage

Colombia (2018): This study aimed to determine the variations of the lipid profile and other quality traits of commercial Hass avocados during post-harvest storage. The fatty acids that predominated in the avocado fatty acid profile included oleic, palmitic, linoleic, palmitoleic and linolenic acids. The oleic and linoleic acids constituted more than 80% of the fatty acids. Avocado quality was reduced particularly above one or two weeks of storage because of softening, weight losses, and the decrease of oleic acid content, and chroma and hue angle pulp colour indices that can be associated with development of chilling injury and/or atmosphere within the bags.

New post-harvest organic edible coating for avocado

South Africa (2018): This study investigated a novel edible carboxyl methylcellulose (CMC) containing moringa leaf and seed extracts as (1) a post-harvest coating application to improve avocado fruit quality and (2) a post-harvest disease control agent that contains antimicrobial properties for reducing disease incidence. The results showed that CMC containing moringa extract suppresses or delays post-harvest diseases of avocado and improves the shelf life of avocado during storage. The CMC blended with moringa extracts could potentially be commercialised as a new organic edible coating for avocado fruit for future industry application.

Prochloraz and thyme oil drench treatment in avocados

South Africa (2018): This study was focused on investigating the influence of the combined effect of aqueous plant volatiles with half strength prochloraz solution to control anthracnose and stem-end rot in the green-skinned avocado cultivar (Fuerte). The incidence of stem-end rot was 10% by the combination of prochloraz® (500 µg mL⁻¹; P50) with 0.1% v/v thyme oil compared to the 58.8% incidence exhibited by the untreated fruit during storage at 6.5°C for 14 days followed by three days at retail shelf conditions (15°C) (preventative application). Citral (0.1% v/v), P50 (500 µg mL⁻¹) + 0.1% v/v citral and yucca extract alone reduced the stem-end rot incidence to about 25% during storage. More so, thyme oil (0.1% v/v) reduced both anthracnose and stem-end rot incidence to 35% after postharvest storage and P50 (500 µg mL⁻¹) + 0.1% v/v thyme oil and 0.1% v/v thyme oil effectively induced the activity of phenylalanine ammonia lyase, chitinase and β-1, 3 glucanase in fruit inoculated with *Lasioidiplodia theobromae* and *Colletotrichum gloeosporioides* through the improvement of quality and firmness of the fruit after storage.

More information

If you would like more details on any of the snapshots, please contact Avocados Australia on 07 3846 6566.



Biosecurity update on ambrosia beetles

Louisa Parkinson and Andrew Geering, Queensland Alliance for Agriculture and Food Innovation (QAAFI), The University of Queensland, Brisbane, Australia

Ambrosia beetles are major invasive pests and significant threats to horticulture and forestry operations. In this review, two of the major threats to the Australian avocado industry are described.

Laurel wilt

Laurel wilt, caused by the fungus *Raffaelea lauricola*, is vectored by the Redbay ambrosia beetle *Xyleborus glabratus*, a member of the Xyleborini tribe of beetles. Laurel wilt is one of the greatest biosecurity threats to the Australian avocado industry. The beetle carries the fungus in specialised mycangial sacs that are located near its mouthparts. When a beetle bores a hole into a tree branch, it deposits fungal spores, which infect the heartwood and the larvae feed upon the fungal hyphae. The beetles are in a sense, primitive farmers.

Ambrosia beetles are normal components of healthy ecosystems, as they usually only infest stressed or dying trees, and in this role facilitate forest recycling and regeneration. As a group, ambrosia beetles are important invasive pests, as they are able to survive in harvested logs and untreated timber. The Redbay ambrosia beetle was first detected in the USA near Savannah, Georgia, in 2002, and is thought to have entered on solid wood packing material used for cargo. The beetle established and has rapidly spread within the south-eastern states of the USA by infesting Redbay (*Persea borbonia*), a

dominant tree species on the coastal plains and a favoured host of the beetle. What distinguishes this epidemic is that the beetle has attacked healthy trees, not just trees in decline. Major jumps in the beetle distribution have been observed, probably due to people transporting infested firewood.

Ambrosia beetles have very unusual mating systems, and introduction of a single female would have been enough to establish a colony. The females are diploid (2N) while the males are haploid (N) and an unmated female beetle will parthenogenetically reproduce (that is, asexually) to produce males, which then mate with their mother to produce the next generation of females. These beetles mate with the males, resulting in a clonal lineage. The male beetles are flightless and remain in the brood galleries, while the females make short flights to colonise neighbouring trees, thus spreading the disease.

Laurel wilt has now spread into Miami-Dade County, where the avocado industry in Florida is primarily based, and an estimated 9,000 trees have succumbed to the disease. While the beetles are attracted to avocado trees, it is not a good reproductive host and the beetle is dependent on the presence of Redbay trees to sustain its population. Only a single, aborted attempt by the beetle to bore into an avocado branch is sufficient to transmit the disease. Avocados are hyper susceptible to *R. lauricola*, with necrosis developing in the xylem, and symptoms of leaf wilt and frass (the refuse produced by boring insects) or exudate development at the bore holes. Once the fungus infects the tree, the main mode of transmission within the orchard is by root grafting. Other ambrosia beetle species that are better adapted to avocado may also transmit the fungus as contaminants on their backs.



Figure 1: Laurel wilt of Redbay (*Persea borbonia*) in Gainesville, Florida



Figure 2: Vascular discoloration of laurel wilt affected Redbay (*Persea borbonia*)

Australia is currently free of *X. glabratus*, despite the strong trade links and shorter distance between Australia and Asia, where the beetle is thought to have originated. Molecular diagnostic tests are available for the rapid detection of *X. glabratus* and *R. lauricola* in case of an incursion. It is unclear how well *X. glabratus* would establish in Australia. Epidemics of laurel wilt in the USA are undoubtedly linked to the presence of Redbay trees, and whether there are indigenous Lauraceae in Australia that could occupy the same place in the ecology of the beetle is not known. Some branch dieback from laurel wilt has been noticed in Camphor Laurel (*Cinnamomum camphora*) trees in Florida, although Camphor Laurel does not appear to be a good beetle host.

In the USA, there are few control options for laurel wilt and it is recommended that affected trees be uprooted and burned or chipped immediately to reduce the risk of beetle infestation in the orchard, with chipped wood pieces treated with an approved insecticide. As a preventative measure, surrounding trees can be protected with macroinjected propiconazole fungicide (this is an injection method). Insecticides are generally not recommended on orchard trees due to the risk of residues in fruit. Nevertheless, so far no insecticide or biocontrol agents fully stops *Xyleborus* beetle activity.

Fusarium dieback

A second ambrosia beetle problem, associated with the *Euwallacea fornicatus* cryptic species complex, has created concern for avocado industries around the world. The beetles deposit *Fusarium* spp. onto gallery walls of branches for larvae

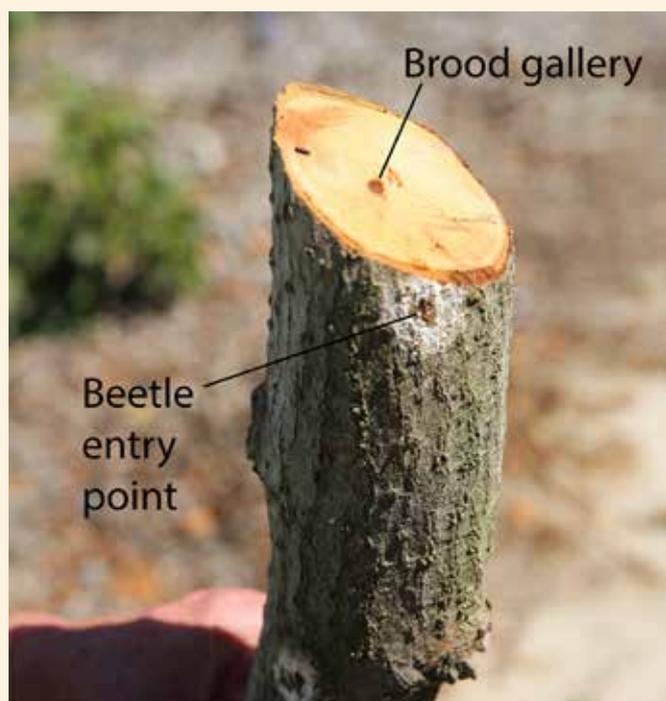


Figure 3: Polyphagous Shot Hole Borer symptoms on avocado in Ventura County, California

and beetles to feed, and the fungus invades the vascular tissue of the tree, preventing water and nutrient transport and causing branch dieback. Unlike laurel wilt, damage from the *Fusarium* wilt is more localised, and normally restricted to only a portion of the tree.

E. fornicatus acquired its common name, the Tea Shot Hole Borer (TSHB), in Sri Lanka, where it has been a major pest of tea plantations for about a century. Research interest in *E. fornicatus* gained significant momentum in the last decade, mainly because of serious and very visible infestations that occurred in avocados and ornamental trees in Israel and California, USA. Compared with *X. glabratus*, *E. fornicatus* has a very broad host range and old street trees in the leafy suburbs of Los Angeles were noticed dying.

To better understand host-pest associations, a molecular systematics study was undertaken, using beetle specimens from around the world. The outcome of this study was that at least three cryptic species were present and *E. fornicatus* in the strictest sense comprised beetles with a generally southern range in South East Asia and Australasia, including Sri Lanka, Southern India, Southern Thailand, Singapore, Malaysia, Papua New Guinea and Australia. Interestingly, there were also records of this species in Hawaii and Florida, suggesting human-assisted dispersal.

Beetles in southern California (Los Angeles Basin), Israel, and more recently South Africa, represented a second species, which has not yet been formally described but colloquially referred to as the Polyphagous Shot Hole Borer (PSHB). The native range of the PSHB is thought to be northern Thailand, Vietnam, China, Taiwan and Okinawa, Japan. The third species, called the



Figure 4: Polyphagous Shot Hole Borer symptoms on native vegetation in Ventura County, California

Biosecurity update on ambrosia beetles continued

Kuroshio Shot Hole Borer (KSHB), has the most restricted native range, confined to Taiwan and Okinawa. The KSHB has recently invaded San Diego County in California.

The diversity of *Fusarium* mutualists carried by the various shot hole borers is also vast, with at least 16 cryptic species detected, 12 of which lack formal scientific names, including those that have been found in Australia. Many biological questions remain about the significance of this speciation, such as whether each species varies in pathogenicity and host range.

Knowledge of *Fusarium* Dieback in Australia is poor. Only a single specimen of *Euwallacea* beetle was included in the molecular systematics study described above, so the conclusion that only the TSHB is found here is weakly supported. There are museum reports of *Euwallacea* beetles associated with *Fusarium* Dieback in various hosts across Australia including Lauraceae, avocado (*Persea americana*); Fabaceae, Leichhardt bean (*Cassia brewsteri*), black bean (*Castanospermum australe*) and Queensland ebony (*Lysiphyllum carronii*); Malvaceae, various species of *Brachychiton* (Illawarra flame tree, kurrajong, lacebark tree and Queensland bottle tree); Moraceae fig trees including the Moreton bay fig (*Ficus macrophylla*) and desert rock fig (*F. platypoda*); Myrtaceae, red box (*Eucalyptus polyanthemus*) and coral gum (*E. torquata*); Pittosporaceae, native frangipani (*Hymenosporum flavum*) and Victorian box (*Pittosporum undulatum*); Proteaceae, Grampians banksia (*Banksia saxicola*) and macadamia nut (*Macadamia integrifolia*). Discussions with agronomists and horticulturists in the Australian industry also reported *Euwallacea* beetle and fungal specimens in mango (*Mangifera indica*) and blueberry (*Cyanococcus*).

Fusarium Dieback was recently identified in suburban landscape tuckeroo trees (*Cupaniopsis anacardioides*) on Mooloolah Island, South East Queensland in late 2017. The beetle vector detected in tuckeroo was found to be the same species, *Euwallacea fornicatus*, which was identified in avocado trees in central Queensland in 2009, and later reported in 2011. However, the *Fusarium* symbiont is an undescribed species. The invasive beetles and their mutualist fungi are a threat to forestry, urban landscapes and horticulture and the presence of TSHB and *Fusarium* Dieback in tuckeroo in an avocado-growing region poses the potential for widespread impacts on the avocado industry.

In Australia, infestations of *Euwallacea* in avocado plantations are sporadic, and appear most severe on the Atherton Tableland. It is recommended that selective pruning of affected branches be used to reduce further dieback and ambrosia beetle proliferation in individual trees. Studies have demonstrated Quercivorol lures as highly attractive to *Euwallacea* beetles and this may help to alleviate beetle populations in orchard trees. Integrated disease management and control measures to suppress *Euwallacea* beetles and fungi need to be investigated.

Our avocado biosecurity project will investigate the diversity of Xyleborini ambrosia beetles and the dieback-causing fungal symbionts in Australian avocado trees and other hosts, and diagnostic capacity to identify these will be established. Research is underway for identifying and describing the new *Fusarium* species, and testing for the ability of the fungus from other hosts to cause dieback in avocado.

Contacts

If you do observe ambrosia beetles in your orchard, we'd be interested to hear from you (email: l.parkinson@uq.edu.au).

Further reading

You can find the final report for *Biosecurity capacity building for the Australian avocado industry: Laurel Wilt* (AV10004) in the BPR Library, www.avocado.org.au/best-practice-resource/library/.

Read more about the North Queensland ambrosia beetle surveys on pages 57-59.

Acknowledgments

We are grateful for financial support from the avocado levy payers through Hort Innovation project *Avocado industry biosecurity capacity building* (AV16010).

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Ambrosia beetle survey in North Queensland

Kaila Ridgway, Ian Newton and Geoff Dickinson, Queensland Department of Agriculture and Fisheries, Mareeba

Ambrosia beetles may be one of the causal agents for branch dieback in avocado orchards in North Queensland. A survey was conducted in late 2017, by the Queensland Department of Agriculture and Fisheries (QDAF) with Atherton Tablelands avocado growers, to investigate the extent of infestation from the ambrosia beetle and its symbiotic pathogen, and to assess the potential threat to avocado production in Australia.

Background

Avocado ambrosia beetles (*Euwallacea fornicatus*) are small (1-2mm), and live in a symbiotic relationship with the fungi *Fusarium* spp. The beetles and fungi have a wide host range; including both crops and native species. The females carry fungal spores in a specialised sac in their mouthparts called mycangia. Only female beetles can fly, and do so only once in their lifetime to establish a new gallery, generally in dead or dying branches. The fertile female bores galleries or tunnels within the branch, inoculating the plant tissue with fungal spores. The female then lays her eggs amongst the fungal hyphae which is the direct food source for both the larvae and adults. Wood is not a food source. The fungus could eventually penetrate and cause disease in the vascular tissue of the branch, blocking sap flow, which could result in branch dieback. The development cycle of the beetle may last between five and eight weeks. All beetle development stages are found all year round.

The survey

The survey was completed in late 2017, with responses obtained from 11 growers and included 47 avocado blocks of varying location, soil type, tree age, variety and management practice. The largest number of blocks surveyed were from the "Golden Triangle" (Atherton/Kairi/Tolga) and Walkamin sub-regions, the main avocado growing areas of the Atherton Tablelands. Overall, the survey comprised 26 Hass blocks, 20



Adult ambrosia beetle

Shepard blocks and one Maluma block. The total orchard area covered by the survey was 765 hectares (Table 1).

Growers were asked questions on the presence/absence of ambrosia beetle in their orchards, their management practices, estimates of productivity impact from ambrosia beetles and their overall levels of concern for this threat. Most interviews were conducted on-farm and included a field inspection of trees to monitor for ambrosia beetle activity.

Table 1. Location and variety details for the 47 survey blocks including area in hectares and number of sites (in brackets).

Location	Variety			Total area & block number
	Hass	Shepard	Maluma	
Dimbulah	3 (1)	45 (2)	37 (1)	85 (4)
Golden Triangle	261 (14)	22 (4)	-	283 (18)
Mareeba	3 (1)	162 (8)	-	165 (8)
Tumoulin	80 (6)	-	-	80 (6)
Walkamin	40 (4)	112 (6)	-	152 (10)
Total ha	387 (26)	341 (20)	37 (1)	765 (47)

Results

Location and soil type

The survey found ambrosia beetles were present on 40% (19 of 47) of the avocado blocks assessed in this survey. These blocks were located in all five avocado growing sub-region locations in the Atherton Tablelands. The highest proportion of orchards with reported incidence of ambrosia beetles was in the Walkamin area (70% or 7 of 10 blocks), followed by Dimbulah (50%),



Ambrosia larvae and adults inside dead branch. Photograph: Ian Newton

Ambrosia beetle survey in North Queensland continued

Mareeba (33%), the Golden Triangle (33%) and Tumoulin (17%).

The soil types of each survey site were classified as either Ferrosols (krasnozems), Kandosols (earths) or Chromosols (duplex). The highest incidence of blocks with ambrosia beetle were the earths (60%) and duplex soils (57%). The lowest incidence was found on the krasnozems soils (34%). Krasnozems soils are generally deep, well-drained and fertile, and are locally regarded as the more suitable soil type for avocado production in the region and represent 74% of all blocks assessed in this survey. It is important to note that the incidence recorded from different soil types could also be complicated by soils from different geographic or climatic areas.

Variety and tree age

Ambrosia beetle was recorded on both Hass (42% of blocks) and Shepard (35% of blocks) varieties. However, the amount of damage (which was not accurately determined in the survey) could vary between varieties. Only one block of Maluma was surveyed, with a positive record of ambrosia beetle on this variety.

Orchards varied in age from one to 39 years, and were sub-

divided into five-year age classes for comparison. The youngest block affected with ambrosia beetle was four years old and the oldest was 39 years old. Incidence of blocks with ambrosia beetle was 13% for trees aged 0-5 years, 71% for trees 6-10 years, 50% for trees 11-15 years and 50% for trees >15 years old.

The age class with the highest ambrosia incidence was 6-10 years old. This is also the tree age where industry concerns and grower enquiries to QDAF have been most common. It is possible that this could be due to the growth stage of the tree; whereby lower branches are now being shaded-out by the upper canopy, and inner canopy dieback is at its highest level, therefore more susceptible to ambrosia beetle attack. Also, the tree height is still low enough where ambrosia beetle symptoms can be more easily recognised from the ground, as compared with taller trees.

Management practice

Not all growers were able to give accurate details of nitrogen fertiliser practice, however, the results which were collected from the 33 blocks where data was supplied, suggested that nitrogen rates may have an influence on ambrosia beetle presence. The blocks which received a low rate of nitrogen fertiliser of <100kgN/Ha/Year had a low ambrosia beetle incidence of only 15% (2 of 13 blocks). Blocks which received a higher nitrogen fertiliser rate of >100kg/Ha/Year, had a higher ambrosia beetle incidence of 55% (11 of 20 blocks). The higher nitrogen rates could also produce higher vegetative canopy growth and thus higher rates of shade-out and inner canopy death; hosting more beetle sites.

Pruning practice was surveyed, however, these results were inconclusive, and likely a confusion of cause and effect. Orchards which had the highest pruning levels, eg select limb removal twice per year and deadwood removal twice per year, also had ambrosia beetle incidence at high levels of 63% and 57% respectively.

Grower concerns

All growers in the survey were aware of ambrosia beetles, most having learnt about these pests through presentations at the annual Regional Avocado Industry Workshops, industry resources, or through positive identifications from pest scouts or QDAF. The level of concern amongst growers that ambrosia beetles were/or could have an economic impact on crop productivity for a particular block was spread evenly, with low concern for 34% of blocks, moderate concern for 34% of blocks and high concern for 32% of blocks.

There was much uncertainty amongst growers if ambrosia beetle activity was causing an increase in canopy/branch dieback and hence impacting productivity, or if they were mainly attacking sick, weak or senescing branches that were dying anyway. A third of growers considered that overall,

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canopy dieback was an increasing issue in their orchards and that ambrosia beetle may be a contributor to this problem. In one of the worst blocks, a 15-year old Hass orchard in the Golden Triangle, one grower estimated that canopy dieback and a related high population of ambrosia beetles were likely responsible for a 35% yield reduction in this orchard.

Conclusions

This survey provided a useful snapshot of local ambrosia beetle occurrence and the levels of grower concern for this pest, across a wide range of avocado orchards throughout the Atherton Tablelands. However, more research work is required to understand the problem. Does the beetle and/or fungus actually cause significant economic loss, or is it mostly secondarily damage? Is the economic damage different in different avocado varieties? What is the economic threshold at which farmers need to act? And what are the best management options? Growers are advised to continue monitoring for this pest and to contact DAF Mareeba if they have concerns about further productivity impacts.

More information

This is a new and relatively unknown problem in Australia that needs further investigation. Report any unusual detections of

pinhole borers to your state department of agriculture, or the Exotic Plant Pest Hotline on 1800 084 881. You can find more information on the pinhole borer in the growing section of the Best Practice Resource: www.avocado.org.au.

Read more about two threats posed by the ambrosia beetle on pages 54-56.

For more information, email geoff.dickinson@daf.qld.gov.au.

Acknowledgments

We thank the 11 avocado growers on the Atherton Tablelands who co-operated in this survey. Simon Newett (QDAF, Nambour) and Carol Wright (QDAF, Mareeba) are also thanked for assisting survey activities and analysis. The survey was conducted with support from the project *Achieving more consistent yields of quality fruit in the Australian avocado industry* (AV14000), funded by the Hort Innovation Avocado Fund.



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Old dogs and new tricks: new tools for dry matter

Kerry Walsh, Professor, Plant Sciences, CQUniversity Australia

Avocado fruit maturity

The maturity of an avocado fruit at harvest impacts eating quality of ripe avocado fruit in two ways.

Firstly, the fruit must be at a minimum ('physiological') maturity level in order to ripen without shrivelling or developing a watery taste and rubbery texture. Secondly, oil content increases as fruit mature and oil content determines flesh creaminess and smoothness, and thus eating quality of ripened fruit (Hofman *et al* 2013).

Fruit maturity is recognised by external skin or stem colour in some, but not all, cultivars. Seed coat colour changes to brown as fruit mature, and oil content increases. Oil content is proportional to dry matter (DM) and inversely proportional to moisture content (Parodi *et al.*, 2007).

There is a parallel situation in mango, where fruit DM at harvest is proportional to Brix of fully ripe fruit, and thus to eating quality. Because of this, the Australian Mango Industry Association has set a minimum DM specification for harvest. Fruit DM level associated with harvest maturity varies with growing conditions, but for a given population, fruit DM is an index of fruit maturity (Anderson *et al.*, 2017).

Minimum DM specifications have been set in significant production regions (eg Arpaia *et al.* (2003) and Gamble *et al.* (2010), Magwaza and Tesfay, 2015). A maximum DM specification has also been set in some regions, to decrease the incidence of disorders in storage. Fruit can be left on the tree for a year, with increasing DM, but fruit have shorter shelf life, are prone to diseases and rancidity. Fruit harvested at the same maturity ideally should ripen evenly. Sorting fruit by DM content can provide lots of fruit with similar maturity that ripen evenly.



A

B

Figure 1: A fan forced oven (A) and an oven-balance (B)



A

B

C

Figure 2: Pictures of instruments (A) F750, Micronir (B) and (C) SciO

Measuring avocado DM

Unfortunately, the traditional methods for measuring fruit DM (eg oven drying) are time consuming. Fruit flesh can be weighed before and after drying at 65-75°C (Figure 1A), or a drying balance can be used, which weighs the sample as it dries (Figure 1B).

In contrast, short wavelength near infrared spectroscopy is a rapid and non-invasive technique that can be used to assess DM content of avocado (eg Schmilovitch *et al.* (2001) from Israel, Clark *et al.* (2003) from New Zealand, Blakely *et al.* (2016) from South Africa, Magwaza and Tesfay, (2015) from South Africa, Wedding *et al.* (2010) from Australia).

Several factors have stymied rapid adoption of the NIR technology: (i) measurement error; (ii) instrument portability. The avocado fruit has a thicker skin than some other fruit, and

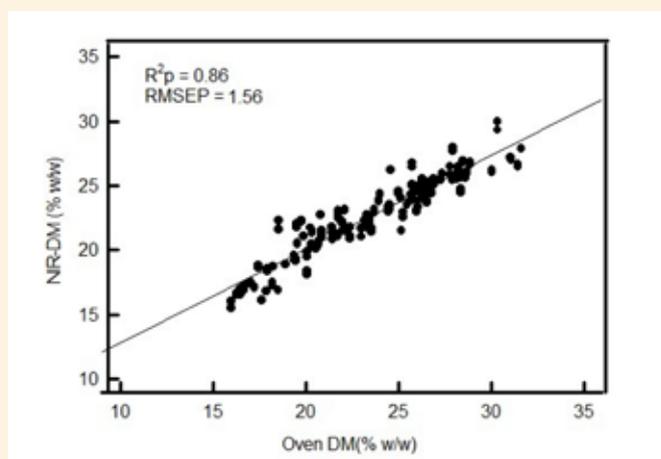


Figure 3: Example of predicted (NIR-DM) values for a group of fruit, compared to oven DM values for these fruit.

the NIR method has to get through the skin, into flesh, and back through the skin, so it is not surprising that measurement error for measurement of avocado DM is higher than for thinner skinned fruit (think apple or mango). Typically, an error of 1.5% DM is reported.

Some results

We used three portable instruments (*Figure 2*) to assess avocado fruit DM. The process followed was similar for all units – spectra were collected of a range of fruit, the fruit flesh cored and DM measured by oven drying, and a ‘model’ created that related spectra to oven-DM. Thereafter, fruit ‘NIR-DM’ was estimated from spectra (*Figure 3*). The F750 instrument did best in estimation of DM in new populations of fruit (*Table 1*) and the rest of this article is based on use of that instrument.

Table 1. Avocado fruit DM prediction statistics for three handheld portable NIR devices, using intact fruit and fruit with skin removed. Calibrated with 120 fruit, and used in prediction of 60 fruit. RMSEP is a measure of the error of the measurement.

Device	Intact fruit		
	R_p^2	RMSEP (%w/w)	Bias (%w/w)
F750	0.71	1.37	0.64
Micro-NIR	0.37	2.71	1.95
Scio- v1.2	0.31	2.05	2.34

It is important to remember that DM is being measured indirectly and the operation of the unit should be checked against the primary method (oven-DM) occasionally. It is possible that a change in fruit (eg skin thickness) could bias measurements. More work is needed to understand what might impact measurements. The Australian Mango Industry Association manages this issue by running calibration checks for all owners of an instrument during the mango harvest season.

How to use such a tool

As a handheld unit, fruit DM can be measured of fruit on tree, and the increase in DM over time followed (*Figures 4 and 5*). This can be useful for ranking orchard blocks for order of harvest.

With a geolocation device inside the F750 units, each measurement can be displayed on a farm map. ‘FruitMaps’ is a free on-line web-app that can be used to see measurements on a farm map, with averages and rate of change per block, and predicted harvest time (ie time to reach a user set DM level) (*Figure 6*).

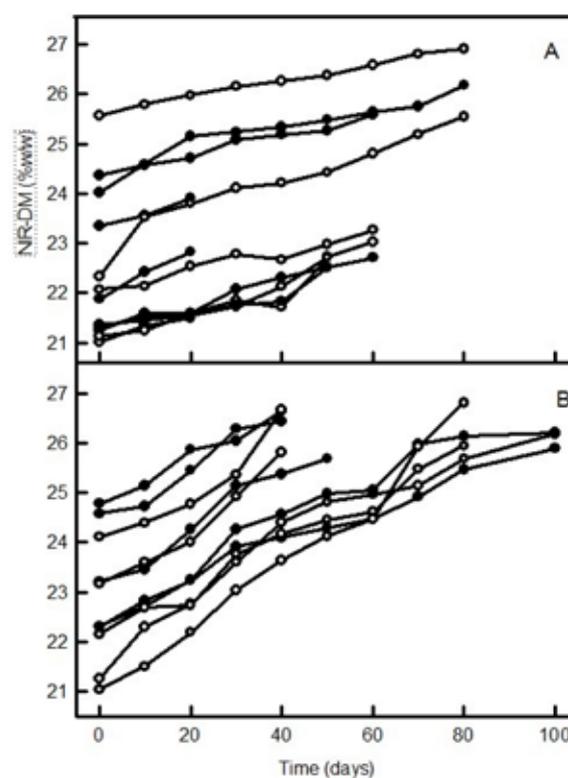


Figure 4: Time course of NIR-DM assessed of fruit on tree for average ($n = 20$) for each of 12 and 10 orchards of (B) Shepard and (C) Hass cultivars, respectively. Fruit were monitored weekly until harvest.

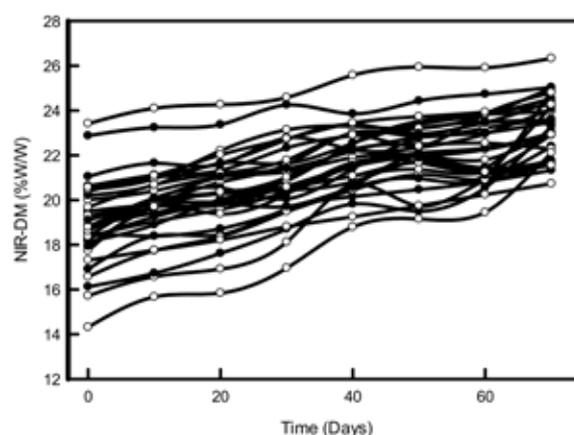


Figure 5: Time course of NIR DM assessed of fruit on tree for individual Shepard fruit, ($n = 30$).

The technology can also be used to assess ripening fruit (*Figure 7*). In the illustrated case, fruit DM has increased as fruit have transpired (lost water). A future use could be a direct prediction of days to ripen, to be used in the decision of when to out-turn fruit from ripening rooms.

Old dogs and new tricks: new tools for dry matter continued

Old dogs and new tricks

Hopefully that's enough description for you to consider if this technology can be useful to management of your crop. I am certain the technology has use with avocado, and curious as the ways it will be used.

Acknowledgements

This work was supported by *Multiscale monitoring of tropical fruit trees* (ST15005). This project involved funding from the Australian Government Department of Agriculture and Water Resources' Rural R&D for Profit program and is delivered with support from Hort Innovation. We thank producers Groves Grown Tropical Fruits, Simpson Farms, MMM Mangoes & Avocados, and Tim Heath for supply of fruit. We acknowledge involvement in the development of the F750 instrument and linkage to Felix Instruments, manufacturer of the F750 instrument.



Figure 6: An example of in-field fruit maturity maps.

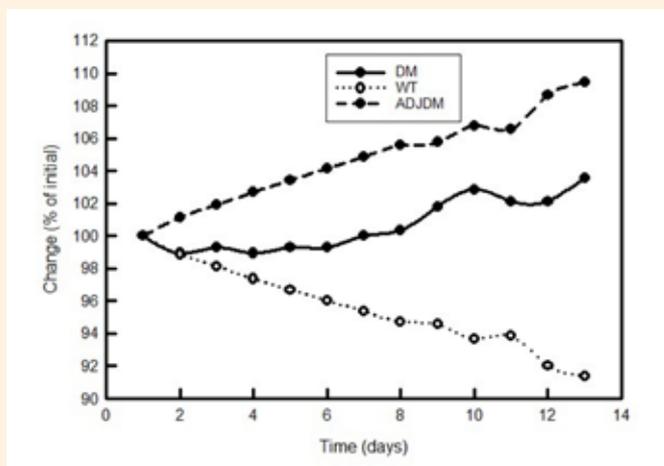


Figure 7: Average fruit weight (open circle), NIR estimated dry matter content (solid line) and dry matter content estimated from the day 1 NIR DM and daily water loss (dashed line) (n = 12). Results are expressed as a percentage of the Day 1 value.

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Tracking fruit fly via a mobile app

A new startup claims it will provide real-time fruit fly detection and monitoring to help Australian producers battle against the devastating pest.

RapidAIM has been founded by researchers from Australia's national science agency CSIRO Dr Nancy Schellhorn, Darren Moore, and Laura Jones.

Main Sequence Ventures, who manage the CSIRO Innovation Fund, is making the \$1.25M investment in the startup, which successfully trialled the technology with fruit producers in Victoria last year.

"Growers rely on weather radar and take action accordingly, but until now they haven't had any pest 'radar' to support them against pests like fruit fly," RapidAIM Chief Executive Dr Nancy Schellhorn said.

"Existing fruit fly monitoring relies solely on manual trap checking, which limits the scale and depth of available information and costs valuable resources."

Fruit flies lay eggs in fruits and vegetables as they ripen. The hatched maggots ruin the produce from the inside, creating huge losses for producers and costing millions in clean-up efforts. Current fruit fly monitoring involves manually checking traps containing pheromones or food to lure the pests in.

The RapidAIM system uses low-powered smart sensors to detect insects like fruit fly from their characteristic movements. The sensors, which can be placed by the thousands, send data to the cloud using a radio modulated technique, giving producers real-time data flow of the pest on their farms and regions through a linked mobile app.

Australian Government Minister for Industry, Science and Technology, Karen Andrews, said RapidAIM was backed by the Coalition Government's National Innovation and Science Agenda (NISA).

"Fruit flies cost Australia's horticulture sector around \$300



*The RapidAIM team,
Laura Jones Nancy Schellhorn and Darren Moore.*



million a year and can have a major impact on our fruit and vegetable growers," Ms Andrews said.

Dr Schellhorn said the new technology can reduce crop loss and provide early warnings of future pest hotspots.

"Our new technology can reduce the time spent checking traps by more than 35%, and provides an immediate picture of fruit fly presence in specific locations to enable a rapid response for control," she said.

Dr Schellhorn said the technology had huge potential for managing food and fibre pests around the world.

"Around the world, more than 900 million tonnes of insecticide is used to control insect pests every year, but 98% reaches a target other than the intended destination," Dr Schellhorn said.

"With RapidAIM technology, crop-protection products can be used in a more targeted way."

The RapidAIM team was supported by CSIRO's innovation program ON. Both Main Sequence Ventures and ON were created through the National Innovation and Science Agenda (NISA).

Minister for Agriculture David Littleproud said the Coalition Government had also committed \$1.35 million to fund the trial of the automated smart traps as part of the RapidAIM system.

"The trial will compare the automated traps to the currently used manual traps in locations in South Australia, Western Australia, New South Wales, Victoria and Tasmania," Mr Littleproud said.

"The smart traps use lures to attract fruit flies. Females are lured in by food and males by chemicals they think will make them more attractive to female flies.

"Sensors will be able to detect when a fruit fly is in the trap by their characteristic movements and send an alert to a grower's mobile phone.

"This innovative technology could provide farmers access to real-time data about the presence of fruit fly on their farms and across their regions, so they can respond to an outbreak quicker."

Coordination to prevent *Xylella* incursion

A Wine Australia and Hort Innovation project, through the Plant Biosecurity Research Initiative (PBRI), will appoint a national coordinator to prioritise how to protect Australia from *Xylella fastidiosa*, an exotic bacteria that prevents a plant from feeding by impeding the movement of rising sap.

While Australia is currently free from *Xylella*, it threatens more than 350 commercial, ornamental and native plant species across the country, potentially including avocado.

The impact of *Xylella* overseas has been catastrophic, infecting more than 200 million citrus trees in Brazil, destroying one million olive trees in Italy and devastating the Californian grape sector – causing annual losses in excess of US\$100 million.

Leaf scorch in avocado is only known to be present in Costa Rica where it is also found on coffee and citrus, according to Plant Health Australia (<http://bit.ly/TA293XYL>).

Dr Jo Luck, program director at the PBRI, said there was no known cure and prevention was the only safeguard against what has been deemed Australia's most threatening exotic plant disease.

"Through the PBRI, we are taking a coordinated approach, together with the nation's seven plant-focused research and development corporations, Plant Health Australia, the Department of Agriculture and Water Resources, industry, state and federal biosecurity stakeholders, to stamp this threat out before it can take root."

Wine Australia and Hort Innovation are currently recruiting a *Xylella* coordinator to develop research and development priorities and projects.

The coordinator will manage cross-sectoral biosecurity preparedness, act in a liaison role for potentially affected sectors, and ensure there is national awareness and coordination of high-priority RD&E to prevent the pest arriving and establishing.

The *Xylella* Coordinator will also help to facilitate project management of two further projects currently under evaluation by Hort Innovation, to investigate strategies for prevention and preparedness, as well as the review and adoption of the world's best-practice diagnostic methods for the detection and identification of *Xylella*.

Xylella fastidiosa

Xylella fastidiosa lives in the water-conducting vessels (the xylem) of plants, and symptoms include leaf scorching, gradual reduction in fruit, stunting of shoots, dieback and eventual plant death. It is mainly spread by sap-sucking insects, or through the movement of infected plants or cuttings. Removal of infected plant material and control of vectors are the only control methods.

Xylella fastidiosa is the organism responsible for Pierce's disease and is an invasive bacterial plant pathogen. It has a wide range of hosts and infects a large number of other commercial and ornamental plant species including citrus, olives and lucerne.

Short video at www.agriculture.gov.au/pests-diseases-weeds/plant/xylella.

In late 2015, Australia introduced emergency biosecurity measures to reduce the risk of an incursion. These include offshore testing of nursery stock and plant material coming from regions where *Xylella fastidiosa* occurs and certification.



A plant affected by *Xylella*

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See your levy at work with the latest HORTLINK! Get an update on all new, current and recently completed levy-funded activity with the new edition of Hort Innovation's Hortlink.

Just released, you can check out the avocado section at <http://horticulture.com.au/hortlink-2018-edition-2/avocado/>.

As well as easy-to-read project updates, results and resources you can use in your business, Hortlink includes case studies, industry contacts and more. Don't miss the Faces of Horticulture section, which includes a closer look at Hort Frontiers activity, scholarship opportunities and other handy info.

Stay in the loop with your levy by becoming a member of Hort Innovation, the grower-owned, not-for-profit research and development corporation for Australian horticulture. Paying a levy doesn't automatically make you a member, but signing up is free at www.horticulture.com.au/membership.



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Research and Development

News from Around the World

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

New Zealand international avocado conference

The New Zealand Avocado International Industry Conference drew delegates from across the country and the world in August.

NZ Avocado CEO Jen Scoular said the conference was a celebration of the industry, focussing on future success in the global avocado world.

The avocado conference hosted international visitors, including speakers Loren Zhao, co-founder of China's largest online fresh produce retailer Fruit Day, Jorge Restrepo, Executive Director of Corpohass Columbia, and Professor Neena Mitter from the University of Queensland.

Dr Nicholas Gill, Strength and Conditioning coach for the New Zealand All Blacks and an avocado grower himself also spoke at the event. Dr Gill shared the secrets of New Zealand rugby's ongoing success on a global stage and talked about the role of avocados in high performance sports nutrition and in eating well in New Zealander's everyday lives.

"We are delighted at the level of support the New Zealand avocado industry has received for this event, from the New Zealand Prime Minister and our international guests,



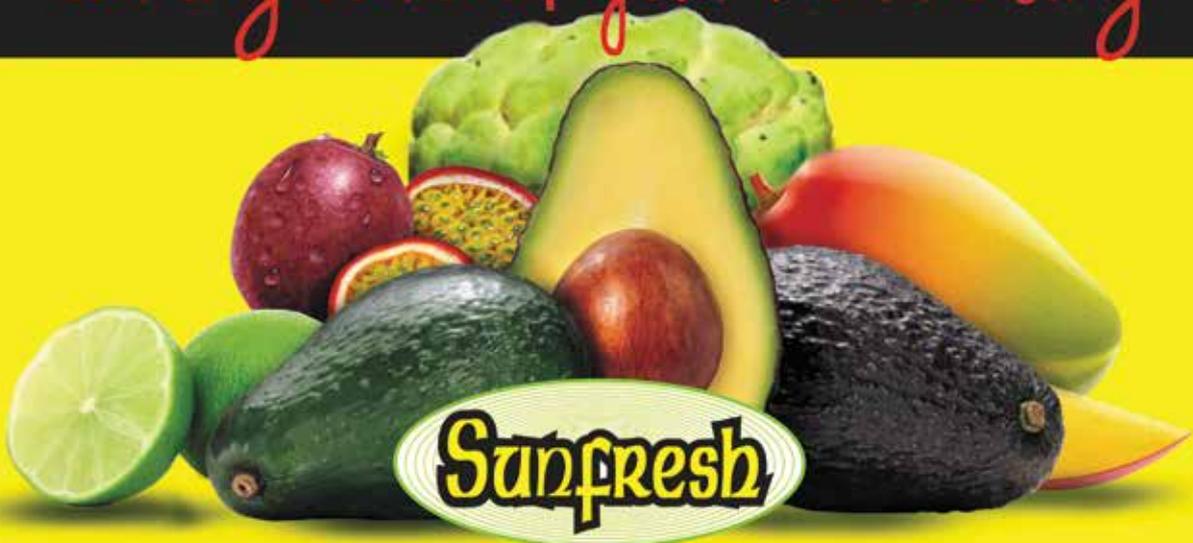
Avocados Australia Director Dudley Mitchell (centre) at the New Zealand Avocado International Industry Conference with various industry members including NZ Avocado CEO Jen Scoular.

participants, speakers and sponsors," Ms Scoular said.

"There is huge demand for our avocados in international markets and a lot of interest from other avocado supply countries in the industry systems that enable New Zealand to produce premium quality, safe and sustainable avocados for the world."

The Right Honourable, New Zealand Prime Minister Jacinda Ardern opened conference, congratulating avocado growers on the recent success of the New Zealand avocado industry which has been driven by a carefully grown, premium quality product which meets the needs of health-conscious consumers globally.

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"In a very short time we've seen the appetite for avocados – a fruit that was not that long ago considered exotic – grow exponentially. That is testament to the passion and dedication of all of you," the Prime Minister said.

Chinese sales booming for Mr. Avocado

It's been reported that Mr. Avocado is currently selling between 65,000 and 75,000 fruit a day in China.

Speaking to *Produce Report*, Mr. Avocado's General Manager, Ms Liu Mosu, said her company expects to count the large majority of Chinese supermarket and hypermarket chains as its customers.

According to *Produce Report*, Mr. Avocado has been in business for 1.5 years as a marketer of ripened avocados.

"It is also considering adding a third avocado ripening facility in China, and is making progress in construction of an enormous new domestic China avocado growing base," *Produce Report* says.

Mr. Avocado is a China/foreign joint venture company involving Lantao (an importer and distributor), Pagoda (a fruit-specialist chain retailer) and Mission Produce (an avocado supplier), augmenting its ripening technology with a complete distribution system.

"Using supply from Mission Produce that is imported by Lantao, Mr. Avocado ripens imported avocados in its own ripening facilities located in Shanghai and Guangdong province before selling them to a variety of retail customers around China, including Pagoda fruit shops," *Produce Report* says.

In June of this year, Mr. Avocado announced that it would establish a massive new avocado plantation base in southwestern China's Yunnan province.

"The 6,600 hectare base is expected to reach a maximum production of 100,000 tons of avocados annually starting from 2022, allowing Mr. Avocado to deliver a fresher product to Chinese consumers and diversify its supply – as well as potentially to export to neighbouring Asian markets under the Mission Produce brand," *Produce Report* says.

"In the months since that announcement, workers have reportedly finished building nursery facilities and started large-scale seedling production."

Produce Report said Mr. Avocado was also considering adding a third China ripening facility, and might announce specific plans by the end of next year.

"It would join the original ripening centre in Shanghai and a new facility opened earlier this year in Huizhou, Guangdong, adjacent to major Pearl River Delta markets. The location of the new facility would presumably be chosen to efficiently deliver ripened avocados to a wider geographical area."

Source: <http://bit.ly/TA293CHINA>



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 or call toll free 1300 303 971.

For Associate and Affiliate membership application forms please go to: 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:

Email:

Grower Member Application Form continued

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. Details are listed below.

Credit card type (please circle): Mastercard Visa

Credit card number: _____

Name on credit card: _____

Expiry date: _____

Signature: _____

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

Avocados Australia
Reply Paid 8005
Woolloongabba Qld 4102

(no stamp required within Australia)

Or email admin@avocado.org.au

For more information or assistance please go to www.avocado.org.au or call on **07 3846 6566**

News from Around the World continued

Michoacan's avocado production up

Michoacan's avocado production has increased by 20% during the last two years, reported the Ministry of Rural Development and Agrifood (Sedrua).

In a statement, the agency stated that production currently amounted to more than 1,117,000 tons.

The agency recalled that in 2017 Mexico's avocado production amounted to 2,029,886 tons, 80% of which (about 1,600,000 tons) was produced in Michoacan.

They also stated that avocado cultivation generated 16,800 direct jobs and more than 70 thousand temporary jobs.

According to the Sedrua, the avocado is no longer an exotic fruit and it has become a product that is exported to more than 45 countries in the world, which indicates that it has had sustained growth.

"10 years ago, finding an avocado in the US market was almost impossible, as its price was very high and could only be found in exclusive places. Now, this fruit has become very popular and can be found in most American diets because of its benefits," they added.

Sedrua recognised the important role played by producers in the consolidation of this product, which wouldn't be possible without their constant work to obtain national and international health and safety certifications.

Mexico is expected to produce more than 2,029,886 tons of avocado production in the 2017/2018 season.

Facing the future: PMA

Cathy Burns, PMA CEO

To grow a healthier world, the produce industry can make new connections to ideas within and outside produce and floral. That was the message from Produce Marketing Association (PMA) CEO Cathy Burns at the PMA's 2018 Fresh Summit Convention & Expo in the US in October.

Online Opportunities

With the third-party food delivery sector expected to reach \$24.5 billion by 2022, apps like Instagram have added "take action" buttons to order food right from your smartphone.

In response, one food marketer is using AI, image learning, and interactive quizzes to study a user's Instagram feed and make recipe suggestions.

Seventy-six percent of US consumers purchased a product they discovered in a brand's social media post; viewers also retain 95% of a message when they watch it on video, compared to 10% when reading it. Marketers should think about what this means for their video content and social channels.

In the consumer realm, global grocery sales through

e-commerce channels increased 30% in the past year. Countries leading this growth charge were China, South Korea, the United Kingdom, and France.

Currently, only 28% of shoppers say they bought fruits and vegetables online, because produce bought through this channel falls short of meeting their standards for freshness and quality.

For some, they find joy in picking their own fruits, vegetables and fresh foods in store.

Robotics and Automation

From retail to foodservice, there is continued growth in robotics across our industry. For example:

- Robomart, an autonomous, mobile convenience store prototype was unveiled in the US
- a restaurant named Creator features a completely automated burger-making robot
- Spyce Foods robotic woks make custom grain bowls.

Robotic assistants, such as pollinators or wheelbarrows, help ease some of the challenges in finding both human, and non-human, help in the fields.

While high-tech experiences certainly provide a “wow” factor, human employees play an important role in providing a personalized, customised experience.

Talent in the industry

A McKinsey Global Institute report found that by 2030, demand for technological skills will rise by 55%. Demand for social and emotional skills will rise by 24%.

Another study suggests that businesses are increasingly being judged based on their relationships with their workers, customers, communities, and impact on society.

Interestingly Millennials’ opinions about business’ motivations and ethics – which had trended up the past two years – decreased in 2018, as did their sense of loyalty. In 2018, only 48% of Millennials believe businesses behave ethically and 47% believe business leaders are committed to helping improve society.

Because of this, 43% of Millennials envision leaving their jobs within two years, while 28% seek to stay beyond five years. Gen Z respondents expressed even less loyalty, with 61% saying they would leave within two years if given the choice.

To keep these talented employees, employers should ensure they have meaningful work, career feedback, diversity, inclusion and flexibility.

In addition, both Millennials and Gen Z employees expect employers to provide education and training to keep their skills aligned with emerging technologies.

This is especially important as younger workers come to the marketplace with a special passion for innovation and making a meaningful difference in the world.

Sustainability surges

While advances in tech are fundamentally changing how work gets done, who does it, and how it influences society, there is an expectation that these forces be channelled for the broader good.

Since sustainability beliefs have driven growth in plant-based foods, Clemson University researchers found that front-of-pack sustainability icons don’t draw shoppers in.

During a study that used mobile eye tracking, 92% of participants did not notice sustainability logos on the packages, despite more than 40% claiming sustainability influences their buying decisions.

Instead, they recommend a more effective way to engage consumers on sustainability is through integrated marketing and education – not simply via a logo.

Cultural connections

We believe produce safety must be a cornerstone of an organisation’s values, character and culture.

The industry’s mindset around produce safety must shift from a cost centre to a cultural imperative. We have to approach produce safety differently. The things we have done in the past may no longer be appropriate going forward given our increased knowledge of the science and expectations of consumers.

We must adopt a “follow the science” philosophy that embraces emerging technologies and all the tools we have at our disposal.

PMA’s belief is that produce safety must be a cornerstone of an organisation’s values, character and culture.

But just as important, we believe that it is those very values, character and culture that will determine how effective an organisation’s produce safety efforts are in the first place.

That’s because produce safety isn’t just an action; it’s an attitude. Your produce safety program has to reflect your core beliefs.

Nothing short of doing the right thing – always – is sufficient.

We must also embrace emerging technologies to help us turn food safety from a reactive enterprise to a proactive approach where we use tech to prevent outbreaks.

Even though we are popular, we have room and opportunity to increase fruit, veg and floral consumption for the health of our businesses and the world.

If we are going to grow a healthier world, we must continue to shape cultural influences and share the incredible work our industry does every day with a global audience.

Source: <https://www.pma.com/content/articles/2018/10/state-of-the-industry>

Japanese fresh market overview

The Japanese fresh fruit market is estimated at around 4.71 million MT demanded as of 2015, according to a new GAIN Report from the USDA's Foreign Agricultural Service.

The October 2018 report says that Japan currently imports one-third of fresh fruit demanded, about 1.6 million MT in 2017, led by banana, pineapple, kiwi, orange, and grape fruit.

While the Philippines and the United States are the top source countries for Japan (based on the value of fresh fruit exports), the GAIN report notes the sector is highly competitive with other countries making some inroads to the market.

Opportunities for fresh fruit exports to Japan are expected to increase in the near- to medium-term due to a decrease in Japan's domestic production resulting from aging fruit farmers.

Domestic production

Japan is located in the temperate zone and it produces a wide variety of fruits suitable to the climate of each region nationwide. Japan produced 3.63 million MT of fresh fruit in 2015 (based only on fruit produced from perennial trees and plants, not annuals such as strawberry or watermelon), based on the latest data compiled by the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF). Fruit production was led by apple with 22.4%, followed by mandarin with 21.5%, watermelon with 9.4%, and Japanese pear with 6.8%.

The GAIN report notes Japan's fruit production has been in decline since its peak in the 1970s, the result of the country's industrial structure transformation that occurred in the latter half of the 20th century, during which the primary industry, as a whole, lost its share of the Japanese economy to the secondary and the tertiary service industries.

Japanese farmer numbers

While the decline of fruit production slowed in 2000, a drop in recent years has been attributed to a falling number of fruit farmers.

The GAIN report says fruit farmer households have decreased by 15% over five years, down to just over 210,000 in 2015.

The fruit farmer households led by those in their 60s and over 70 accounted for 31% and 39% of the total fruit farmers in Japan in 2010. In just five years, this combined 70% jumped up even further to 77% of fruit farmer households in 2015.

Fresh fruit imports

The major suppliers of fresh fruit to Japan were led by the Philippines with 57.9%, the United States with 9.4%, Ecuador with 9.1% and Mexico with 6.7%, the GAIN report says.

In 2017, total imports of fresh fruit to Japan was valued at US\$2.14 billion. The leading exporters to Japan (on value) were the Philippines with 37.7%, followed by the United States (16.8%), New Zealand (14.4%), and Mexico (12.6%).



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Declining fruit consumption

According to the GAIN report, not only is the Japanese population decreasing, daily fruit consumption is also declining.

Daily fruit intake per person by age group data shows that all the age groups showed a decline over the 10-year period, from the 2003-2005 average to the 2013-2015 average, with only one exception, the over 70s. Those who consume the fruit most tend to be elderly people in their 60s and over 70 and those in their 20s, 30s and 40s consume the least.

The GAIN report says this general downward trend of fresh fruit consumption per person is partially due to intensified competition in the snack and dessert

sector; fruit is considered as dessert or snack among Japanese consumers. This tendency has been accelerated further by changes in taste preference among Japanese consumers, particularly among younger generations. More recently, Japanese prefer sweet taste to sour taste and consumers also prefer easy-to-peel or easy-to-prepare options. Therefore, they tend to opt for sweet and easy-to-peel fruits such as bananas among fruit options, or go for other non-fruit dessert and snack options.

The main fruits imported to Japan were banana with 39.8%, followed by kiwi (14.7%), avocado (9.6%) and pineapple (5.9%).

In 2017, Japan imported 60,635 MT of avocados, at a value of US\$205,405,038 (the third highest category by value, behind bananas and kiwi fruit). Mexico is the primary supplier of avocado with over 90% import share (in volume and value).



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