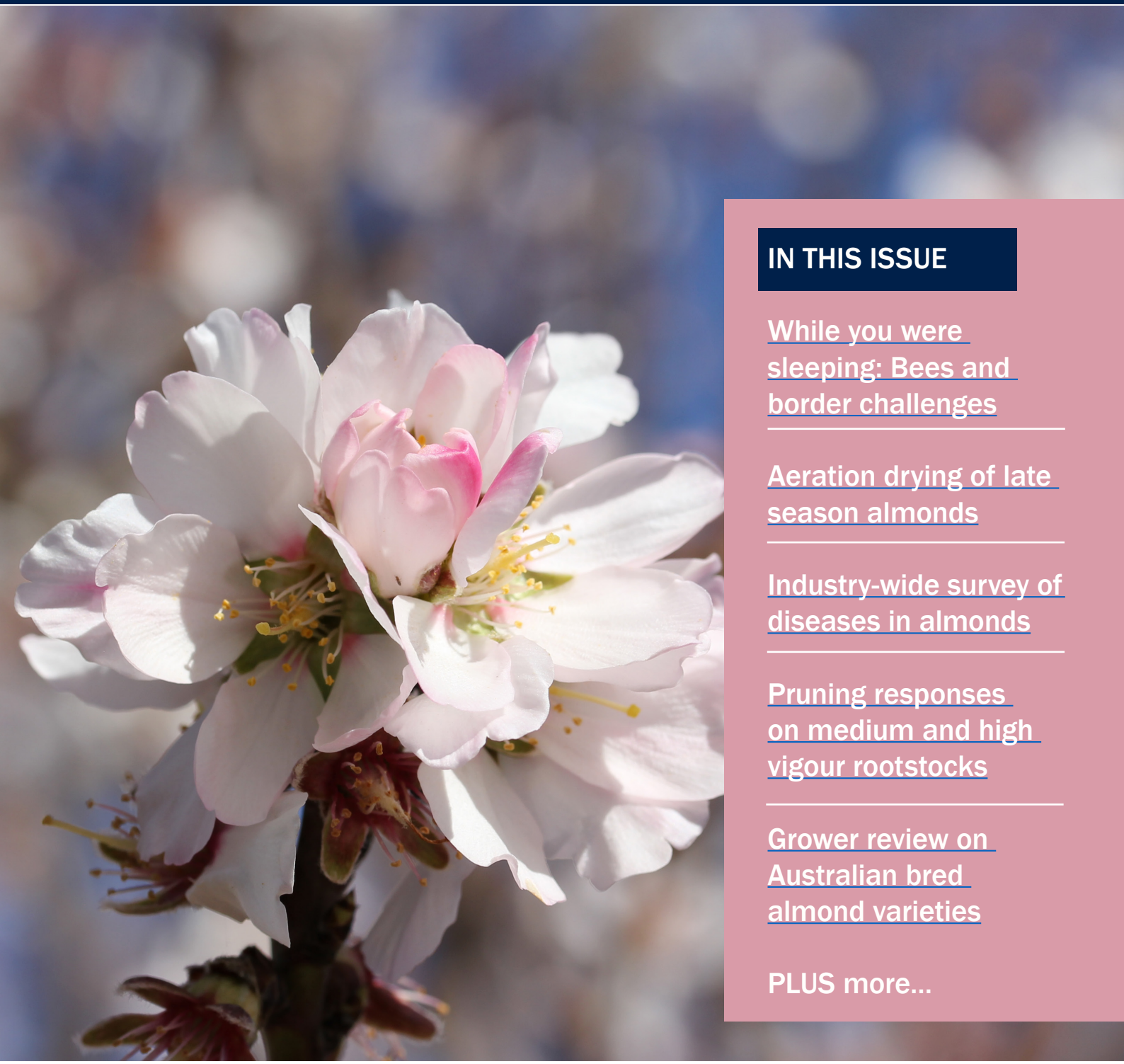
australian almonds

In A Nutshell

The Official Newsletter of the Australian Almond Industry Spring 2020



IN THIS ISSUE

SAVE THE DATE Almond Board of Australia Annual General Meeting | October 7, via Zoom |

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Spring 2020

In A Nutshell

The Official Newsletter of the Australian Almond Industry

Published by: **Almond Board of Australia Inc**

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The Almond Board of Australia is the peak industry body representing the interest of almond growers, processors and marketers in Australia. In a Nutshell is published by the ABA to bring news to all industry contacts and members.

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Some articles within this publication refer to projects managed by Hort Innovation with funding from the grower R&D levy and matched by the Commonwealth Government.

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Hort Innovation
Strategic levy investment

ALMOND FUND

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ALMOND BOARD OF AUSTRALIA

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ALMOND BOARD OF AUSTRALIA

Notice is hereby given that the ANNUAL GENERAL MEETING of the Almond Board of Australia will be held via an online virtual meeting at 11:30am ACST on Wednesday 7th October 2020.

Click for link for online virtual meeting

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ALMOND BOARD OF AUSTRALIA

ABA MEMBERSHIP: JOIN TODAY

The ABA is the peak representative body for the Australian almond industry and as such addresses many issues that impact on all participants in the industry including growers, processors and marketers and those who supply inputs. These impacts can be positives such as free trade agreements or promotion to stimulate demand and hence prices or they can involve minimising negative situations such as food safety issues, market access problems, chemical registrations etc.

The ABA develops and drives the implementation of the Australian industry's strategic plan which is done to benefit all producers and other industry participants. The strategies involve building domestic and export markets, the key to strong grower returns and addressing a wide range of risks from the availability of production inputs to government policies that impact on costs and yields. These matters effect on the bottom lines of almond enterprises.

The ABA's whole of industry strategies have been successful and have worked to ensure the large increases in production have been cleared.

The ABA operates a number of activities that support industry and generate revenue to fund its operations and keep membership fees at a low and affordable cost. Being an ABA member provides crucial support for your industry body that we need and appreciate. A strong membership base provides added force in our representation of industry to government and in the wider community.

Join the ABA today, in the knowledge you are assisting the industry and yourself to move forward as Australia's most valuable horticultural industry.

Join the ABA by visiting our website, phoning 08 8584 7053 or email admin@australianalmonds.com.au

From the *Executive*...

Peter Hayes | ABA Chairperson

Ross Skinner | ABA CEO

The pollination season usually involves concern over cold, wet and windy weather soon followed by concern over frosts. This bloom we had all of the above but also some good flying conditions for the bees and a good overlap of flowering of varieties. Overall, it seems like pollination has progressed satisfactorily and resulted in a good potential crop that hopefully further frosts will not diminish.

The beekeeping industry deserves not only their healthy pay cheque for services rendered but also the thanks of the almond industry as they overcame the setbacks of the bushfires destroying hives and habitat and the challenge of building hive strength and numbers to meet our industry's ever increasing need for hives. To obtain the required pollination services beekeepers brought hives from as far north as southern Queensland and from throughout New South Wales, Victoria and South Australia. This year the beekeepers also had to meet the challenge of border closure protocols that were changing rapidly and at times when beekeepers were already underway with what is considered the biggest movement of livestock in Australia.

The ABA has worked closely with the State and National Apiarist Associations and state governments to find solutions to the border closure edicts to meet the needs of government, beekeepers and our industry. This co-operative effort is deservedly worthy of praise and we thank all those involved and the beekeepers who not only delivered but also moved the hives off orchards after bloom. The efforts of those manning the border crossings should also be noted as they helped as much as they could to facilitate the prompt movement of trucks through the checkpoints. Thankfully no incidents of bee stings were reported and those police and armed forces personnel at the crossings remained safe.

With the growing season for the 2021 crop now underway we are closely monitoring the impact of the COVID-19 pandemic on demand for the 2020 Australian crop and the large US crop being harvested. The global almond prices have fallen and in the past, this has driven improved consumption figures. The Almond Board of California recently reported that they are promoting heavily in world markets to further enhance demand. The pandemics impact on overseas travel is preventing our ability to attend trade events, many of which have been postponed or cancelled. To address this the ABA is developing new engagement activities to maintain our presence in markets.

The strengthening Australian dollar will also impact on grower returns. The brighter news is the price of water and fuel inputs are much lower than during the last few years. In periods of reduced returns, it is critical that the investment in production practices to grow a quality product is not foregone.

Orchard hygiene practices have resulted in a remarkable turnaround in the extent of insect damage to our recent crops and has restored our Australian almond reputation that was seriously jeopardised along with the heavy crop losses when beetle and moth pests gained a foothold in our orchards. Selling into a market with abundant supply will not be easy but made much harder if our product is less desirable than that usually achieved.

Having experienced a horrendous bushfire summer this year in Australia our thoughts are with our Californian almond colleagues who are also witnessing widespread devasting wildfires. Stay safe everyone.

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For more information please contact your local Elders agronomist or visit our website eldersrural.com.au

Elders

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

Grower webinar now available

The Grower Regional Meeting, held on July 6, 2020 via webinar, is now available online for members who missed it or would like to revisit.

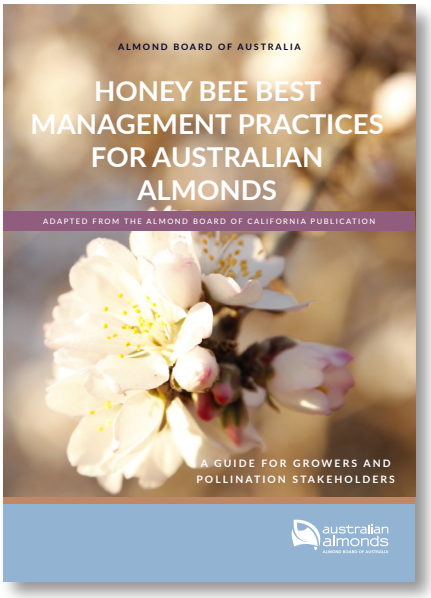
Please email Josh Fielke if you are a member of the ABA and would like to access the webinar online.

Topics covered included:

- A snapshot of the Australian almond Industry
- Australian Almond Sustainability Program
- Almond Centre of Excellence update
- SARDI trials at the Almond Centre of Excellence
- Update from the Almond Board of California
- Export and Domestic Market Updates
- Current industry projects including integrated pest and disease management.

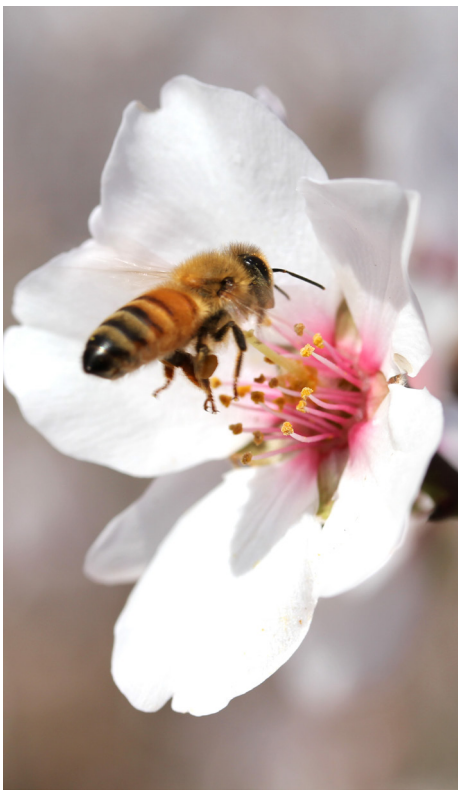
NEW: Honey bee best management practices for Australian almonds

The ABA Pollination Committee has guided the development of a series of publications to actively promote honey bee best management practices for growers to maximise the benefits from honey bee pollination while preserving the health of hives during their short stay in the orchard. As we learn more from our research investment, we will update the ABA Honey Bee Best Management Practices guidelines for Australian almond pollination stakeholders.



The ABA is also encouraging growers to complete a survey which covers various aspects of your farming environment for honey bees during the pollination season. By completing this survey, you will be contributing towards an understanding of our industry's practices in relation to bee management and effective pollination practices.

COMPLETE POLLINATION SURVEY



Pollination best management practice video: Honey bee biosecurity program

For more information about pollination best management practice please view the video below, produced by the Almond Board of Australia Industry Development team.

https://vimeo.com/454224205/e94a9b661f

While you were sleeping:

Bees and border *challenges*

The 2020 almond pollination season was not like any seen before. The beekeeping industry has battled through one of the worst droughts in living memory, seeing honey production decline by up to 90 percent in some parts, and then witnessing the incineration of millions of hectares of precious natural forest destroyed by devastating bushfires. Now more than ever, beekeepers are being recognised for the significant part they play in the supply chain when it comes to food production. The declaration of a global health pandemic and closed state borders across almond growing regions meant the migration of hives was not what it would usually be. More than 227,000 bee hives from all over the nation were required to pollinate orchards in Victoria, South Australia and New South Wales. A coordinated approach was required by the state governments, state apiarist associations and the ABA to ensure the timely delivery of hives. The Queensland Beekeeping Association (QBA) State Secretary, Jo Martin (pictured left) recognised from the outset of the pandemic the impact the border closures would have for not only the beekeeping industry, but also the pollination crops starting with almonds. Jo played a lead role in helping to find a solution for Queensland beekeepers and shares her story.

Hives moving on to an almond orchard. Image credit: Rick Jensen.
Opposite page: Roadside camping. Image credit: Murray Arkadieff.

“In late February 2020, the QBA was invited to provide industry representation for a specific COVID-19 Agricultural Steering Committee to be formed by the Queensland Minister for Agriculture, Forestry and Fisheries, Hon. Mark Furner. The newly formed Queensland Agricultural Coordination Group (ACG) held its first meeting in March of 2020 and continues to be the platform for engagement between the Queensland Government and key industry stakeholders, including ABA staff, working together to create sustainable solutions for the Queensland agricultural/horticultural industries amidst the uncertainty of the global pandemic”, explains Jo.

“It was the involvement in this committee that the QBA was able to ensure the Government’s understanding of the critical role the beekeeping industry has in food production and subsequently receive approval to continue cross-border movements to provide pollination services to many of Australia’s commercially grown food crops."

“In mid-march 2020, as we were briefed from within the ACG on the possibility of the closure of domestic borders within Queensland, the QBA began to ‘map out’ a comprehensive calendar of pollination events and locations for honey flows for the remainder of 2020 and beyond. As a consequence of the ongoing effects of the current drought, presently impacting more than 67 percent of Queensland we recognised that the survival of this industry was underpinned by continued access to forage options for honey bees outside of Queensland”.

The closure of state borders, together with the lack of suitable forage options to sustain the health of the Queensland honey bee industry and the increasing need to supply honey bees for future pollination events, illustrated an alarming picture. It became clear that the QBA would need to take urgent and drastic action to ensure beekeepers continued to have ‘freedom of movement’ whilst remaining compliant with State and Federal Health directives.
In the early stages of the Queensland border closure, it was quickly understood that only general providers of freight and logistics supply chain would be provided with border exemptions. Therefore, any other subsequent travel outside of the state for any other reason would be ineligible for border exemptions placing serious concerns on Queensland’s ability to supply more than 20,000 honey bee hives for the impending almond pollination season.

Even with the announcement made by Minister David Littleproud, Federal Minister for Agriculture, declaring activities within Agriculture being recognised as essential activities amidst the pandemic, there was still little surety for any Queensland based industries undertaking cross border work as any decision on providing approval and subsequent access to closed States and Territories was at the discretion of the State Government who imposed the border closure.

The only way to get hives across the border was to have the industry “reclassified” under the supply chain network, which would make the commercial sector of the industry eligible under a Freight and Logistics border exemption. This was not straight forward with the QBA providing a brief to the Queensland Government advocating that the mass movement of honey bees to be considered as “consigned goods” under a Freight and Logistics supply chain setting.

It took many weeks of daily meetings and much consultation with the Queensland Government, the State Health Emergency Coordination Committee and the Chief Health Officer before the reclassification for the industry was agreed. The QBA was able to quickly communicate the formal approval with much relief to commercial beekeepers allowing them to continue working outside of the State under the same framework as the freight and logistics supply chain providing exemptions from quarantine periods needed to meet critical timing for transporting hives.

Beekeepers would also be granted re-entry access when travelling in both heavy vehicles and light utilities/passenger vehicles as they have always been accustomed to.

The work of the QBA during the pandemic also extended to providing surety and safety training to law officials enforcing the border control measures across the width and length of both the Queensland and the NSW/VIC border. Over this time, the QBA was involved in creating protocol and procedures for border enforcement officials to ensure the safety of everyone working at border checkpoints when processing beekeepers and have supplied personal protective equipment for checkpoint personnel when beekeepers need to be stopped for compliance-based matters.

"At the beginning of border closures, the ultimate goal was to ensure honey bees were delivered on time, with little stress to colonies, and every measure possible was taken to protect the health and safety of beekeepers. We’re absolutely delighted to hear that the 2020 almond pollination season has again been a huge success for all involved, and can’t wait to see this latest crop hit supermarket shelves knowing we played a small yet crucial role in reaching the desired outcome for all."

"The introduction of the pandemic has reinstated old practices within our industry. Due to social distancing requirements our beekeepers have returned to the ways of old, camping roadside or on site with the bees and cooking camp meals to sustain their hungry appetites. Living in the great outdoors as their forefathers once did. Beekeepers have quickly adapted back to the old way of beekeeping and many are using the opportunity to reset the clock in the rather hectic world we all find ourselves living in."

“Every agricultural industry has faced some unique challenges over the past months and years, however, we continue to learn from our experiences, allowing everyone to build a better, stronger and more resilient industry for the future”.

Bee biosecurity *protects* almond production

Jenny Shanks, Bee Pest Surveillance Coordinator and Daniela Carnovale, Project Officer |

Plant Health Australia

Each year brings a concern that an incursion of Varroa Mite in our honey bee colonies may disrupt the pollination season and jeopardise the almond crop. In order to prevent this the almond industry invests in two national biosecurity programs coordinated by Plant Health Australia (PHA) which work to protect honey bees from pests and diseases, safeguarding essential pollination services bees provide to almond crops.

Bee biosecurity is vital to protect honey bees from pests and diseases.

National Bee Pest Surveillance PROGRAM

National Bee Pest Surveillance Program

In 2020, it was estimated that around 240,000 honey bee colonies provided pollination services to more than 40,000 hectares of almond trees in New South Wales, Victoria and South Australia. Given the importance of pollination to almond production the industry contributes funding to the National Bee Pest Surveillance Program (NBPSP), a post-border early warning system for the detection of incursions of high priority honey bee pests.

The program is coordinated by PHA and jointly funded by the Australian Honey Bee Industry Council (AHBIC), Hort Innovation including almond grower levies (MT16005), Grain Producers Australia and the Australian Government Department of Agriculture, Water and the Environment.

The program delivers nationally coordinated bee pest surveillance activities through strong partnerships between all state and territory governments, the Australian Government, port staff and beekeepers.

Currently, the program operates across nine government jurisdictions (including Norfolk Island since December 2019) and captures data for 16 high priority exotic pests and three regionalised pests.

Through the program regular inspections are undertaken of 156 European sentinel bee hives for the presence of mites, beetles and exotic bee diseases. These hives are located across 33 ports.

167 empty boxes (called catchboxes) are also positioned around high-risk ports of entry to capture newly arriving swarms which may be carrying exotic pests.

Surveillance staff use insect nets to sweep flowering plants around ports to target foraging bees, which are inspected and identified if exotic.

Australian Government port staff are also on the lookout for new swarms detected arriving on shipping cargo and freight.

With 18-months remaining in the current program, discussions to identify future bee surveillance program needs will begin in late 2020. This will ensure the NBPSP will continue to effectively protect bee health and thus support the nation's growing pollination demands.

NATIONAL BEE BIOSECURITY PROGRAM

National Bee Biosecurity Program

The National Bee Biosecurity Program (NBBP) is managed by PHA on behalf of AHBIC. It is funded by industry through the honey levy, with support from the state governments.

Through training and education, the NBBP aims to improve Australian beekeepers' management of established pests and increase their preparedness for exotic pest threats to the honey bee industry.

The NBBP employs Bee Biosecurity Officers (BBOs) in each state to do a range of extension and education activities. Their key role is to help beekeepers understand their obligations under the Australian Honey Bee Industry Biosecurity Code of Practice which outlines best-practice bee biosecurity principles.

What you can do

If you use managed hives for pollination you can ask beekeepers about compliance with the Code to ensure you are getting the services that you are paying for when hiring hives.

You can also contact your local BBO for advice if you have any concerns about the health and performance of bees working your crop.

Individual beekeepers and growers can also work together to undertake pollination in a way which supports bee health and almond production.

Maintaining clear and open communication is essential during almond pollination. In fact, many growers and beekeepers find it is best to use a written pollination agreement (page 38) that clearly outlines everyone's responsibilities.

For more information about honey bee biosecurity and pollination visit beeaware.org.au

If you see anything unusual, call the Exotic Plant Pest Hotline on 1800 084 881.

Bee Biosecurity Officer, Ally Dreissen, Agriculture Victoria.

Figure 1: Researchers deploy a balloon trap in an apple orchard in Lenswood, South Australia. (Image credit: Michael Holmes)

Figure 2. Male honey bees attracted to pheromone lures in a balloon trap. (Image credit: Michael Holmes)

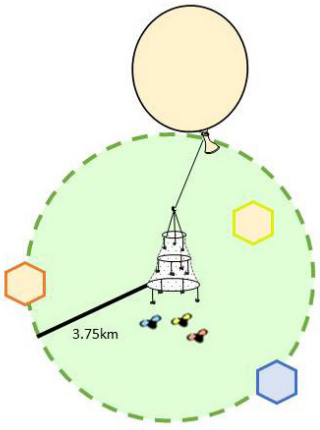


Figure 3: Area sampled by a balloon trap. All drones within a 3.75km radius, an area of 44km², will be attracted to the trap. (Figure by Patsavee Utaipanon)

Pollination: how many bees are in the bush?

Dr Michael J Holmes |

Behaviour, Ecology and Evolution Laboratory

University of Sydney

Almonds are 100 percent reliant on honeybees for pollination, which means when it comes to bees and almonds, there is one very important question: are there enough bees to provide adequate pollination services? Large-scale almond growers will always need to bring in hives during pollination season, but knowing how many colonies are already present in an area could be highly beneficial. As well as satisfying any curiosity a grower may have, accurate honey bee population estimates will inform management decisions should there be a honeybee pest or disease outbreak.

While beekeepers are well aware of how many managed hives are present in an area, knowing how many feral colonies there are is more complicated. Feral colonies are European honeybee colonies that live in the wild without human intervention. These colonies are cryptic, often nesting high in trees. It is not practical to simply go out and count them. However, researchers from the University of Sydney (funded by Agrifutures Australia; project number RnD4Profit-15-02-035) have developed a technique for rapidly and accurately assessing honeybee colony densities.

The technique works by exploiting honey bee mating behaviour. A conical net suspended from a weather balloon is launched (Figure 1). Within the net are lures soaked in honeybee queen pheromone. Once the balloon is in the air, all male honeybees within flight distance will be attracted by the scent of the pheromone and become caught in the net (Figure 2). We then bring the captured males to the lab for genetic analysis.

We use genetic markers to determine how many males in the trap are brothers; in other words, if they are sons of the same queen. We then group them according to family. As there is only one queen per colony, when we know how many families there are, we can use this number as an estimate of the number of colonies within flight range.

In another experiment, we worked out how far males fly when searching for a queen to mate with. We did this by marking males in a focal colony with paint, and launching the trap every 250m away from it until we found no more marked males. We captured marked males at every interval up to 3.75km, but not at 4km. This tells us that drones reliably fly up to 3.75km when looking for a queen, but not as far as 4km. While some drones may fly further, we know that 3.75km is a suitable distance to use in our calculations as the vast majority of drones fly within this range.

We then use these two pieces of information - the number of colonies and the flight distance - to work out colony density. Males fly up to 3.75km when searching for a queen, so we know that all males captured came from colonies within a 3.75km radius - a circle with an area of 44km2 (Figure 3). If we caught 1000 drones and found that they had been produced by 150 queens, we know there are at least 150 colonies within the circle. With an area of 44km2 covered, this works out to be 3.41 colonies per square kilometre.

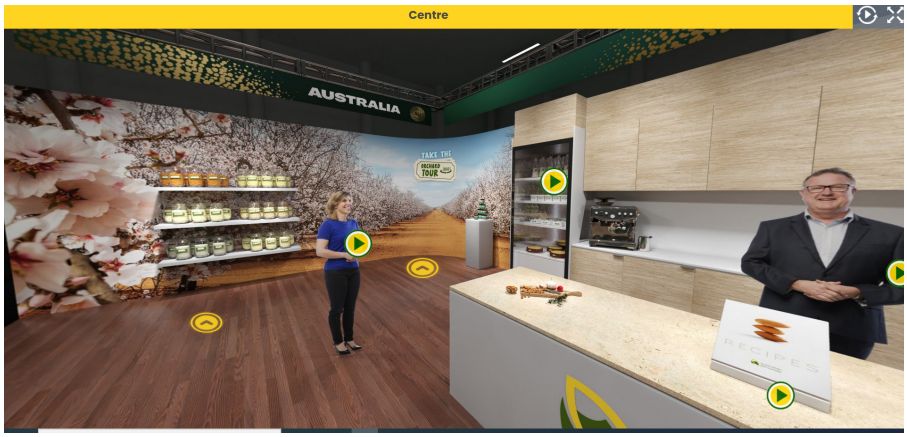
The great benefit of this technique, to almond growers and beekeepers alike, is that it will inform management decisions in the event of an outbreak of a pest or disease. As COVID-19 has taught us, diseases spread rapidly in dense populations. If an area is found to have a high density of feral colonies, we know that this will be an area to focus containment efforts on if an outbreak is detected. This will help safeguard the commercial honey bee industry, and in turn help ensure prosperous harvests for almond growers and all other pollinator-reliant crops.

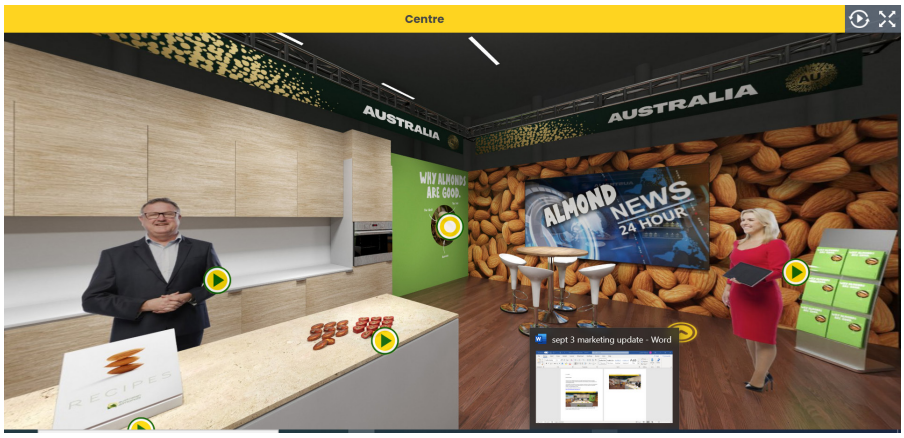
This work is part of the Rural R&D for Profit Program 'Securing Pollination for More Productive Agriculture' funded by Agrifutures Australia.

Marketing update

Joseph Ebbage | ABA Marketing Manager

Lou Martin | ABA Marketing Officer





Top: Our sports dietitian, Simone Austin, provides an insight into her long-standing advocacy of almonds to the athletes she has trained. Simone is one of Australia's leading sports dietitians and has worked with a number of elite sporting teams including the Australian cricket team and the Hawthorn AFL football club.

Bottom: Jemma O'Hanlon is the Nutrition R&D Manager for Hort Innovation and an Accredited Practising Dietitian. Her video provides an overview of the importance of ongoing research for the Australian almond industry.

The last six months of COVID-19 restrictions have significantly altered our domestic and export marketing activity schedules. Instead of physical face to face exhibitions, we have developed new virtual and digital solutions.

The Australian almond industry is the first in Australian horticulture to create a **3D virtual exhibition** capability. We launched this virtual exhibition platform at our recent webinar with Australian dietitians (story on next page) with a very positive response.

It has four 'camera angles' within the booth so the visitor can move around and discover the fourteen hotspots which deliver the content.

The content we can provide to our visitors is diverse and very engaging. It ranges from a virtual orchard tour of a farm in blossom, to our almond showcase with digital clips of our almond range, to our back wall highlighting our key sustainability credentials, to our Almond News 24 video screen with multiple content channels. The exhibition features our two nutrition program ambassadors, Simone Austin and Jemma O'Hanlon, with video to personalise the experience. The booth also offers recipes to enjoy, some information about our snack tins and a digital brochure holder with six factsheets to be downloaded.

This virtual exhibition platform has the potential to be leveraged in our export program as it can be 're-skinned' and customised to targeted export markets.

https://www.youtube.com/watch?v=lxZO-AjwX3Q&feature=youtu.be

Riverina growers feature on Channel 7 Morning Show

During this blossom season, three of our growers and their families generously gave their time to help promote our Australian almond industry. The Dinicola family in the Riverina starred in the segment on the Channel 7 Morning Show which has been aired three times. This show has a weekly audience of over two million viewers.

Neale Bennett provided a voiceover for an almond cooking segment on the My Market Kitchen series produced for the Channel Ten Play Channel. This is their streaming service. Jemma O'Hanlon from Hort Innovation devoted one of their segments to creating a delicious Almond Brownie Bliss Ball recipe with supporting video of our almond orchards. Neale's voiceover helped the viewers understand the importance of bees to pollinate our trees during our blossom season.

Almond Board of Australia's LinkedIn platform

Consistent with this approach of elevating the voice of our almond growers in our communications, we are relaunching our Almond Board of Australia's LinkedIn platform.

Our Almond Board of Australia LinkedIn site will enable us to extend our 'thought leadership' in key areas including our sustainability credentials, our expertise and experience in developing export markets and the latest nutrition information. The LinkedIn platform is aimed at our industry and professional audiences.

One way of growing our reach on LinkedIn is through the active involvement of our growing community. We welcome as many of our growers, processors and researchers to participate on our LinkedIn site as possible.

Nutrition Australia webinar

On September 2, Australian Almonds, Hort Innovation and Nutrition Australia conducted an online webinar which took participants on a journey of growing almonds in Australia. The overall theme was sustainability, providing the audience with a better understanding of the different technology used to drive innovation and sustainability within the industry. We had an overwhelming response to this event, with over 130 people participating.

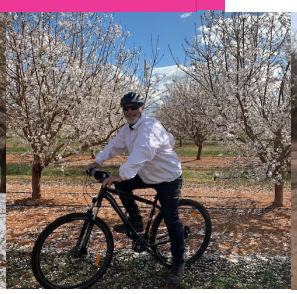
The webinar guest speakers were ABA Board member and Riverland almond grower, Brendan Sidhu, and Simone Austin, an advanced sports dietitian and Australian Almonds Sports and Nutrition Program Ambassador. Brendan Sidhu focused on our industry's sustainable farming practices whilst Simone Austin provided an insight on how we can incorporate more almonds in our diet.

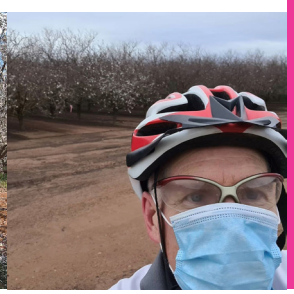
To introduce this webinar, guests were taken on a 3D virtual orchard tour opening their eyes to an orchard in bloom. Everyone who registered for this event received a sample box that included a recipe card, health factsheet, snack tins and three different almond packs (Natural Carmel, Natural Nonpareil and Dry Roasted Nonpareil). These three almond packs were used as part of a sample demonstration where Brendan Sidhu explained the different almond varieties and the characteristics for each type.

australian almonds

BLOSSOM TOUR 5000

McGrath Foundation COMMUNITY FRIEND





THANK YOU: Blossom Tour 5000

THANK YOU to everyone who got involved with the Australian Almond Blossom Tour 5000. There was a combined total of 2,118 kilometers cycled throughout the promotion which is a great effort.

The Almond Board of Australia will donate $5,000 to the McGrath Foundation as part of our Australian Almonds Community Support program.

Aeration drying of late season almonds

Prof. John Fielke |

University of South Australia

During the end of the 2020 Australian almond harvest, almond growers encountered regular rain events that were forecast ahead of their arrival. The forecasts allowed growers to take some actions to protect the quality of their almonds. One grower, Mark Stoeckel at Murtho, South Australia has built a facility for such a season. Mark built an open ended shed, as shown in Figure 1 in 2016. The shed is 27 metres long, divided into two halves each of 7.7 metres width and with an eave height is 6.7 metres. One half was fitted with eight 4 kilowatt fans and underfloor ducts running across the width of the shed at a spacing of 3.2 metres.

The shed had five rows of six sensors to measure the temperature and humidity of the almonds, as shown in Figure 3. These sensors were on hinged beams that are swung into place as the shed is filled and they are pivoted out of the way as the shed is emptied. Sensors were placed at 1.5, 3 and 4.5 metres above the floor. In hindsight, the top sensors would have given improved monitoring if they were placed half a metre lower as they often measured ambient air and not almond conditions.

During mid April 2020 as the rains approached, Mark picked up his recently shaken Carmel almonds and using a conventional almond elevator, placed them into the shed to a depth of 5.5 metres at the centre and 4 metres at the walls (Figure 4). The almonds were not yet dried and had a range of kernel moisture contents of between 10 and 20 percent when they were placed in the shed.

Once the almonds were placed in the shed, the rains arrived and the ambient humidity stayed close to 100 percent for the next few days. Due to the high ambient humidity, the aeration was delayed a few days. After two days, the relative humidity of the air in the almonds soon reached 80-100 percent at several locations in the almonds. After four days of humid weather and no running of the fans, the temperature of the almonds in one location quickly started to rise from 17 to 35°C due to microbial action (Figure 5). Once this was observed, the fans were started and the temperature quickly dropped to below 20°C. Typical temperature and humidity readings at 1.5 and 3 m above the floor are shown in Figure 5.

At the start of the drying, the fans were run when the ambient humidity was below 70 percent and due to the shed's close proximity to a residence, the fans were not run after 9:00pm. With this strategy, it took 16 days for the 100 percent RH in the almonds 1.5 metres above the floor to start to reduce in relative humidity. It was another six days before the almonds at 3 metres above the floor to reduce in their relative humidity.

An oscillation of the almond temperature (Figure 5) was a daily occurrence and followed the temperature of air being blown through the almonds. The drying of the almonds had a cooling effect that often reduced the almond temperature to below the incoming ambient air temperature. The daily oscillation in almond humidity was due to the aeration drying the almond's hulls and hence recording a drop in relative humidity, and then once the fan was turned off the moisture from the kernels migrated out to the hulls and thus increased the relative humidity again but it was to a lower level than before. After all depths of almonds were dropping in humidity, a revised allowable humidity of the incoming air was set to a range of 50-60 percent relative humidity so as to give a final kernel moisture content of 5-6 percent. If an ambient humidity of less than 50 percent was to be blown through the almonds, the almonds near the ducts would have been over dried. On most days during April and May 2020 at Murtho there was one to three hours per day with the ambient relative humidity in the desired range of 50 to 60 percent which was used for aeration. An automated controller for the shed has been on ongoing project for engineering students at the University of South Australia and in 2020 Tuan Nguyen upgraded the system to control fan operation depending on ambient air conditions with the user selecting which fans and what fan speed would be used.

The almonds were delivered and processed on 5 June 2020. When unloading the shed, samples of almonds were taken at 12 sensor locations and oven dried to measure kernel and hull moisture content. The moisture results for kernel and hull are shown in Table 1. This shows that controlling the humidity of the air being used for aeration can control final kernel moisture content to a targeted value.

Figure 1. The Stoeckel almond shed with eight fans and under floor aeration ducts.

Figure 2: John Fielke (left) and Mark Stoeckel (right) during sensor installation in 2017.

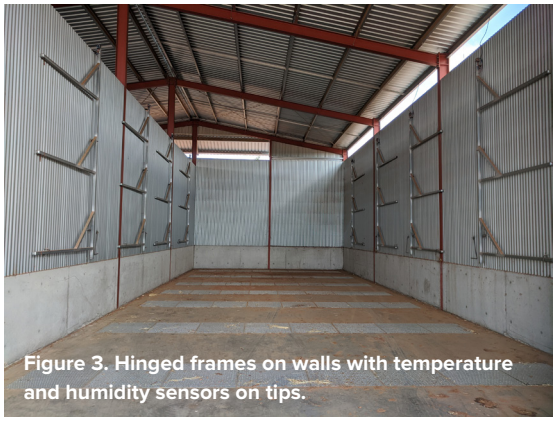


Figure 3. Hinged frames on walls with temperature and humidity sensors on tips.

Figure 4. Carmel almonds placed into the shed.

	Oven drying of kernel	Oven drying of hulls
Average moisture content	5.6%	12.7%
Standard deviation	0.15%	0.36%

Table 1. Almond moisture content after aeration and storage for 49 days.

The delivery of the Carmel almonds from the shed was a total of 106,320 kg which had 9, 200 kg of orchard trash and 31,500 kg of kernel. No quality issues were observed at crack out of the kernel. This shows that putting the almonds into the shed for finish drying and keeping them out of the rain avoided any weather damage and quality losses.

During the 49 days of storage in the shed. the total fan run time for drying the almonds was 250 hours. Maximum fan power use was measured as 3.5 kilowatts per fan and for about a quarter of the time the fans were run at 50 percent speed which only required 0.4 kilowatts per fan. With up to six fans used for the almond dehydration and an electricity cost of 30c/kWh, the total electricity cost for drying the almonds was $1,200.

For further information, please contact Professor John Fielke, University of South Australia.
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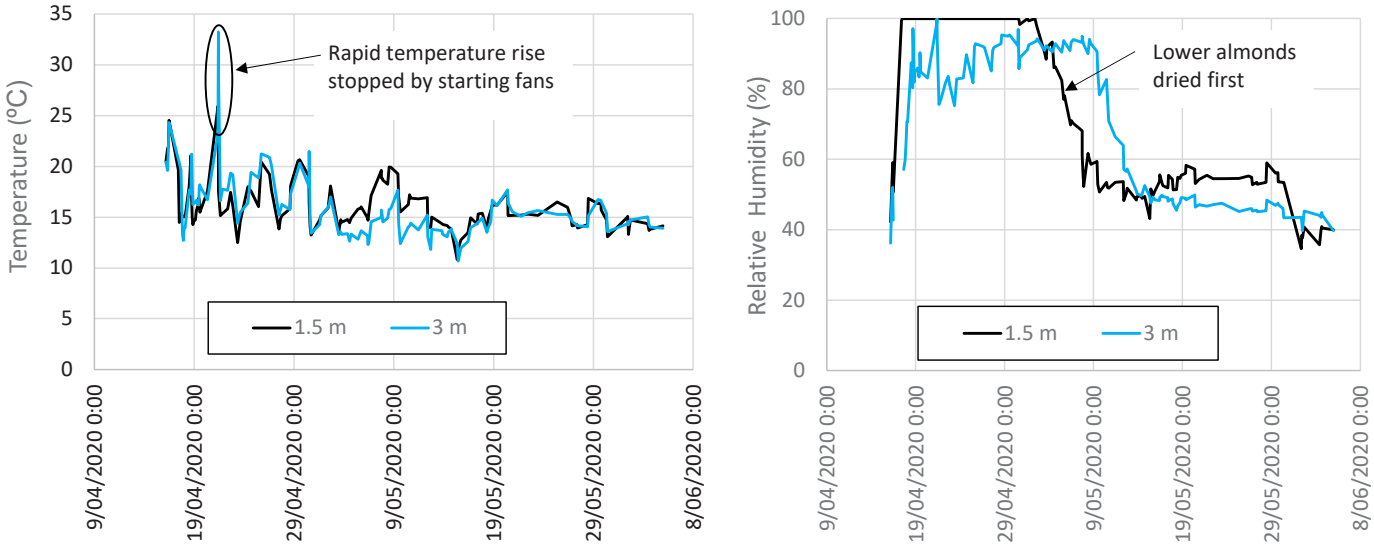

Figure 5. Typical temperature and relative humidity data during aeration drying of almonds

RESEARCH

Pruning responses on medium and high-vigour rootstocks

Grant Thorp and Ann Smith |

Plant & Food Research Australia Pty Ltd

Research is investigating the use of central leader trees and narrow pruning techniques across a range of scion/rootstock combinations. Rather than growers severely pruning their young trees to stimulate scaffold branch development, we believe that planting "unpruned" central leader trees would be an important step towards producing narrow tree canopies. Although trees in this project have not yet reached peak yields, the benefits of planting central leader trees were clear in terms of resilience to wind damage and ease of maintaining a narrow canopy. Interestingly, it was easier to maintain the central leader structure on the more vigorous than the less vigorous rootstocks.

Almond growers are evaluating higher planting densities than is traditional, with some new blocks being planted at 6 x 3 metre spacing (556 trees/ha). Higher yields earlier in the life of the orchard are a distinct advantage of this planting system, but there is a risk that trees become crowded sooner than with traditional planting designs.

Options to mitigate this risk include pruning trees to form a narrow canopy, to allow for closer row spacing, and planting "unpruned" trees to encourage a narrow, central leader growth habit.

Rootstock choice is also important. Trees on high-vigour rootstocks can be useful to obtain high yields from young trees but they compound crowding issues as trees become older. In contrast, trees on lower vigour rootstocks can be slower to reach their full cropping potential but be easier to manage in the longer term.

To examine these options we planted a trial block at Lindsay Point, Victoria in 2016 with four scion cultivars, 'Carmel', 'Monterey', 'Nonpareil' and 'Price' budded onto four rootstocks 'Bright's Hybrid', 'Cornerstone', 'Garnem' and 'Nemaguard'. These rootstocks were chosen for their vigour rating from medium to high vigour. Low-vigour rootstocks were not included as plants were not available when we started the project.

All of the rootstocks were supplied by Ausbuds Pty Ltd in Moorooduc, Victoria. The clonal rootstocks 'Bright's Hybrid', 'Garnem' and 'Cornerstone' were propagated as own-rooted cuttings; 'Nemaguard' rootstocks were propagated from seed. All rootstocks were delivered to Lindsay Point in October 2014 and dormant budded in March 2015. The budded trees remained in the nursery until July 2016, when they were transferred to the orchard block.

Trees were established with two combinations of tree type and pruning system:

Control: Traditional tree management regime adopted by nursery/orchard to produce trees with multiple trunks growing from a single heading cut applied at 90 cm. All side shoots on the trunk trimmed to 2 cm length when planted in the orchard in 2016.

Central leader – narrow pruned: Trees selected in winter to have a single dominant trunk with multiple side branches that were left unpruned when the trees were planted in the orchard in 2016 (Figure 1). Trees were then pruned in winter and spring 2018 to produce a narrow, palmette-style tree shape (Figure 2).

Note that all trees were pruned in the nursery and orchard block by removing any shoots forming below 60 cm on the trunks, to maintain clear access for tree shakers. The 'Carmel' trees developed severe symptoms of non-infectious bud failure in autumn 2018 and so were not included in further data collection. Unfortunately, we also missed harvest for the 'Nonpareil' trees in 2020.

Key results

• The different rootstocks expressed their expected influence over tree vigour, with trees on 'Garnem' and 'Bright's Hybrid' rootstocks tending to be more vigorous than trees on the medium-vigour rootstocks 'Nemaguard' and 'Cornerstone'. This effect was mainly seen in the size of the trunks rather than tree height (Table 1). Note that although differences in vigour between rootstocks were slight, this effect may not be fully expressed until much later in the life of the orchard.

• Once planted in the orchard, the central leader trees maintained their shape for the first three months of growth (Figure 1). However, by the end of the season the basitonic growth habit, typical of almond trees, came into play and it became difficult to distinguish between central leader and control trees. However, the benefits of having the structural limbs spread over a longer section of trunk, as with the central leader trees, were still apparent (Figure 2).

• The single round of narrow pruning in 2018, when trees were two years old, was sufficient to maintain narrower canopies without reducing yields for the four year duration of this project (Figures 2 and 3; Table 2). These data support the option of growing narrow-pruned trees at 6 x 3 m or even 5 x 3 m spacing.

• 'Monterey' trees on 'Garnem' rootstock tended to produce more crop than on the other rootstocks, producing 3.8 t/ha on 4th leaf trees

Figure 1. Central leader 'Nonpareil' trees on 'Nemaguard' rootstocks at planting in winter 2016 (left) and in mid-summer of first season (right).

Figure 2. 'Nonpareil' trees on 'Bright's Hybrid' rootstock after dormant pruning in winter 2018 (2 years after planting) to produce a narrow, palmette-style tree shape. Note the distribution of scaffold branches along the main trunk of these trees initially planted as central leader trees.

Figure 3. 'Monterey' (left) and 'Nonpareil' (right) trees on 'Garnem' rootstock in January 2020. Trees were planted in 2016. Pruning treatments were applied to groups of three trees each. The first three trees along the row are the unpruned control trees, the second set of three trees are the narrow-pruned trees planted with a central leader. The branches in the unpruned control trees can be seen drooping down with the weight of the fruit.

Nonpareil budded on Nemaguard

Nonpareil budded on Bright's Hybrid

Price budded on Nemaguard

Price budded on Bright's Hybrid

Figure 4. Shoot structure within trees. Scion cultivars budded on 'Bright's Hybrid' rootstock stimulated numerous relatively short axillary shoots, in addition to the normal component of medium to long shoots. This effect was consistent across all scion cultivars tested.

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(Table 3). However, 'Price' trees on 'Bright's Hybrid' rootstock produced substantially more crop than with the other rootstocks, producing 2.9 t/ha compared with 2.2 t/ha on the next best, which was 'Garnem' rootstock.

• All trees on 'Bright's Hybrid' rootstock produced numerous short to medium lateral shoots, in addition to the normal component of long shoots that become large scaffold branches in the mature tree (Figure 4). Although no data were collected, this response to 'Bright's Hybrid' rootstock was obvious across all scion cultivars in this trial. It is possible that the increased branching with 'Price' when budded on 'Bright's Hybrid' rootstock increased the yield from these trees.

•'Price', a very upright cultivar with acute branching angles, required minimal pruning to create a narrow canopy; in combination with 'Bright's Hybrid' this scion/rootstock combination could be a very interesting option for high density plantings.

The future

As part of this project we are also working with almond breeders in Australia, California and Spain to help them to identify new almond cultivars that naturally form narrow, upright tree canopies suitable for orchard intensification. While shell and kernel quality are important breeding targets for almonds, as are self-fertility and pest and disease tolerance, we believe that new cultivars with improved architecture are required for the almond industry to make a step change in productivity.

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Read AL14007 Final Report on the Hort Innovation website.

Rootstock	Tree height	Trunk cross-sectional area (cm^3)
Bright's Hybrid	4.5	119a
Cornerstone	4.4	107b
Garnem	4.5	126a
Nemaguard	4.2	101b

Table 1. Tree dimensions of almond varieties on four different rootstocks in summer 2020. Trees were planted in July 2016. Data are combined for 'Nonpareil', 'Monterey' and 'Price' trees. Values in each column followed by the same letter were not significantly different (p<0.05).

Cultivar	Treatment	Tree canopy diameter (m)	Kernel yield (t/ha)
		2019	2020
Monteray	Control	4.07a	3.283
	Central leader-narrow prune	3.69b	2.976
Price	Control	3.83a	2.325
	Central leader-narrow prune	3.48b	2.127

Table 2. Yield of almond varieties in summer 2020. Trees were planted in July 2016. Control trees were pruned in the nursery to 90 cm and all side branches cut back to two buds. Central leader trees were not pruned in the nursery but were narrow-pruned in the orchard in 2018. Data are combined for trees on 'Bright's Hybrid', 'Cornerstone', 'Garnem' and 'Nemaguard' rootstocks. Values in each column followed by the same letter were not significantly different (p<0.05).

Scion	Rootstock	Kernel weight (kg/tree)	Kernel weight (t/ha)
Monteray	Bright's Hybrid	5.1b	2.85b
	Cornerstone	5.3ab	2.97ab
	Garnem	6.8a	3.76a
	Nemaguard	5.3ab	2.92ab
Price	Bright's Hybrid	5.3a	2.94a
	Cornerstone	3.6b	1.99b
	Garnem	4.0b	2.24b
	Nemaguard	3.3b	1.86b

Table 3. Effect of rootstock on yield of 'Monterey' and 'Price' almonds in 2020. Trees were planted in July 2016. Values in each column followed by the same lower-case letters were not significantly different (p<0.05).

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Project team: Grant Thorp, Ann Smith, David Traeger, Belinda Jenkins, Andrew Granger, Michael Coates (PFR Australia); Andrew Barnett, Michael Blattmann, Edouard Périé, Vincent Mangin, Patrick Snelgar, Stuart Tustin, Jill Stanley and Duncan Hedderley (PFR New Zealand).
Industry support: Ben Brown, John Kennedy, Tony Spiers and Andrew Lacey. Casual seasonal workers were provided by MADEC Australia Renmark.

Hort Innovation Strategic levy investment | ALMOND FUND

This project has been funded by Hort Innovation using the almond research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit horticulture.com.au

Zelmari Coetzee of Agriculture Victoria checking on trial trees near Mildura.

Agriculture Victoria is changing the face of almond *research*

Zelmari Coetzee, Blair Grossman, Michael Treeby and Peta Faulkner |

Agriculture Victoria

Agriculture Victoria Research (AVR) has initiated foundational research as part of their Horticulture Development Plan supported by the Victorian Government's Agriculture Infrastructure and Jobs Fund and consists of two programs around novel orchard designs and efficient orchard management. Two projects relate to almond production and processing.

1. Fast-tracking the development of new orchard planting systems

Novel production systems are needed to remain competitive in an ever-changing competitive global market, characterised by constantly rising input costs and increasingly limited resource inputs. Zelmari Coetzee is leading a group aiming to simulate the long-term performance and profitability of innovative orchard production and management systems.

Figure 1. Low resolution LiDAR point cloud (15 percent of datapoints) of a three-year old Nonpareil almond tree. Canopy light interception and distribution can be determined from the full resolution image by simulating and tracing the sun's rays through the canopy. Colours show the tree height above ground level.

The approach involves taking a concept model developed for pears at Tatura and adapting it to other horticultural crops, for example, almonds. Three steps are involved:

1. establishing relationships between light interception and fruit yield and quality

2. creating virtual 3D representations of novel orchard and tree designs to simulate light interception and predict likely fruit yields and fruit quality

3. developing crop-specific economic models to assess the profitability and financial risks of new systems over a ten-year period.

LiDAR, the same technology used in driverless cars, has made it possible to create virtual high-resolution 3D representations of trees and model light distribution within the canopy (Figure 1). The performance and profitability of proposed novel growing systems can be simulated by estimating light interception in virtual tree forms and combining it with the relationship between light and yield from the concept models.

Initial assessments point to the approach's great potential. Data for the adaptation of the model to almonds are being collected in the high densities planting on AVR's temperate nut research site near Mildura. The planting was established in 2018 to assess the performance of three new Australian cultivars — including two self-fertile types — on different rootstocks planted at different densities.

2. New sensing technologies to detect concealed insect damage in almonds

Kernel damage caused by two insect pests, carob moth *(Ectomyelois ceratoniae*) and carpophilus beetle (*Carpophilus nr dimidiatus*), can infest almond nuts at hull split, damaging kernels and leaving behind contaminants such as webbing and frass.

During processing, sorting equipment detects and removes kernels with visible signs of insect damage but is not able to detect insect damage when the kernel is concealed within the shell (Figure 2). This is a significant issue for the Australian almond industry as there is a growing export market for in-shell product. The inability to detect insect damage in in-shell almonds could potentially limit the growth of this market, highlighting the need for the development of new in-shell sorting technology.

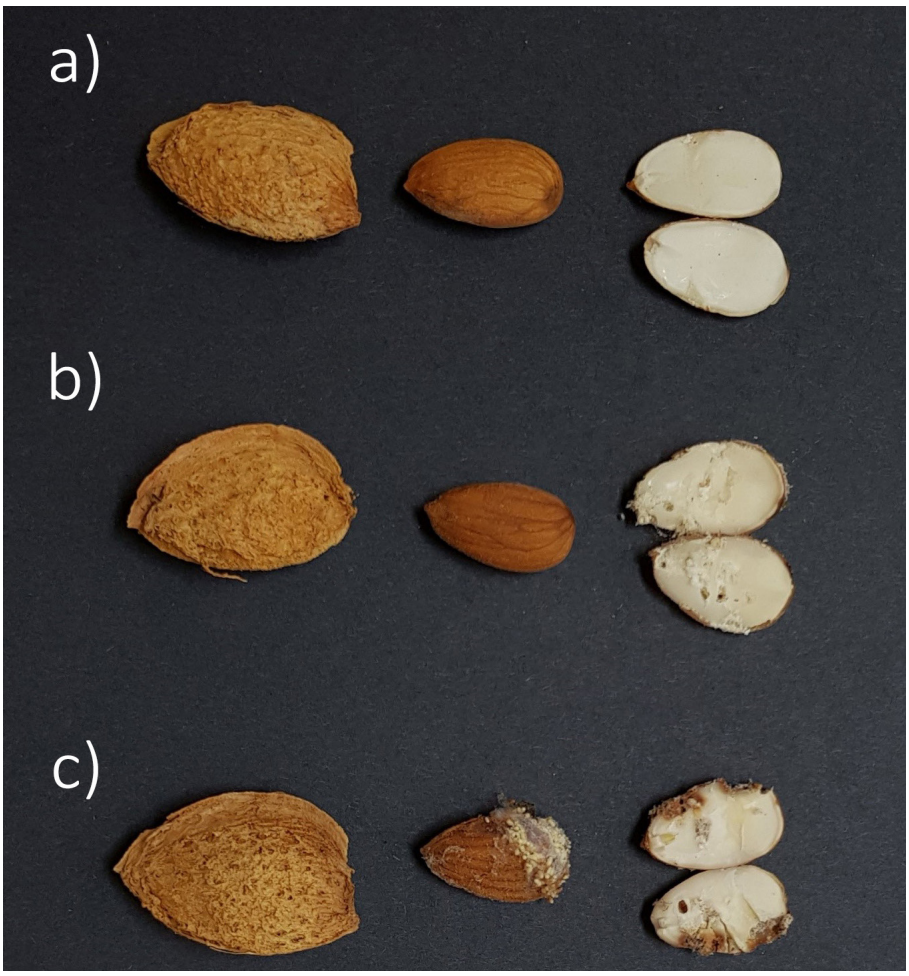

Figure 2. In-shell almonds (left), shelled almonds (centre) and split almond kernels (right) showing a) no insect damage b) carpophilus beetle damage c) carob moth damage, demonstrating how insect damage can be concealed at different levels and can therefore be difficult to detect in processing.

In response to this, two research projects are exploring how new sensing technologies might be developed as tools to detect concealed insect damage in almonds. Blair Grossman and Peta Faulkner are investigating near-infrared (NIR) spectroscopy as a detection tool. Near-infrared spectroscopy can reliably detect concealed quality issues such as browning in almonds and insect damage in walnuts, so it's feasible that it could be used to detect concealed insect damage in almonds. Near-infrared spectroscopy works by measuring the amount of NIR radiation absorbed or reflected by the object being scanned. Different compounds within the kernel, such as water, proteins, lipids and sugars, absorb/reflect different levels of radiation, therefore compositional changes caused by insect larvae consuming the kernel should be detectable using this technique. The goal of the two-year project is to conduct proof of concept experiments, including method optimisation and the construction of a mathematical model, to provide industry with the foundations of a methodology for in-line detection of concealed insect-damaged kernels in-shell.
Steve Tobin and Kevin Farnier have

been investigating how odour sensing technologies might be used in post-harvest detection of insect infested nuts such as unshelled almonds. Using gas chromatography-mass spectrometry (GC-MS), they have analysed the complex chemical composition of odours that are emitted from nuts infested by carpophilus beetle and carob moth. Key "indicator" odorant chemicals have been discovered that indicate the presence of each of these two pests. The research has also involved evaluating a commercially available electronic nose (e-nose) as a rapid detection tool for on farm use. Unfortunately, this particular e-nose was not successful at confidently detecting infested odours, but future e-noses could be designed with sensors more finely tuned to the odorants identified in this study.

Industry-wide survey of diseases in Australian almond orchards

Tonya Wiechel[1], Brittany Oswald[2], Simone Kreidl[1], Peta Faulkner[3], Anjali Zaveri[1], Khageswor Giri[1], Len Tesoriero[4], Suzanne McKay[2], Mark Sosnowski[2] and Jacky Edwards[1,5] |

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To improve our understanding of the diseases affecting the Australian almond industry, researchers from Agriculture Victoria, SARDI and NSW DPI have undertaken orchard disease surveys over two seasons. More than 2,000 trees were assessed in 126 blocks from approximately 10,000 hectares of orchards across New South Wales, South Australia, Victoria and Western Australia.

The planting year of orchards ranged from 1981 to 2018, with most orchards (70 percent) being planted since 2000. The main varieties included the industry standard Nonpareil (49 percent), Carmel (24 percent), Price (5 percent), Monterey (5 percent) and other (16 percent; Vela, Wildtype, Keane, Johnson Peerless, Carina, Fritz, Independence, Ne Plus, Wood colony, Maxima). The most common rootstock was Nemaguard (65 percent) and 69 percent of trees were drip irrigated.

Prior to the orchard survey, growers were asked for their perception of disease issues with the top ten diseases reported to be hull rot, lower-limb dieback, Phytophthora, anthracnose, rust, shot hole, bacterial spot, brown rot, bacterial canker and blossom blight (Figure 1).

Industry-wide disease prevalence

Two years of orchard surveying, beginning in spring 2018 and concluding in summer 2020, found that lower limb dieback (LLD) and hull rot were observed in all orchards surveyed which made up 25 percent of the industry. Other diseases included shot hole and trunk diseases (including Phytophthora) (Figure 2). While shot hole symptoms were consistently observed, they were not considered serious as the disease severity was generally low and managed with fungicide spray programs.

In the survey questionnaire completed in winter 2018, growers perceived anthracnose, rust and bacterial spot as widespread but they were not commonly observed during the orchard survey (Figure 1 and 2).

Regional differences

Regional differences were evident for most diseases (Figure 3, pg 29).

Hull rot is a late season disease and the summer surveys were timed to assess hull rot as close to Nonpareil harvest as possible. Based on assessment of Nonpareil with hull split, hull rot was most prevalent in the Riverina, Adelaide Plains (AP) and Sunraysia, with some in the Riverland, and little hull rot observed in Western Australia. Hull rot without associated twig dieback was prevalent in Adelaide Plains with some in the Riverland and very little in Riverina and Sunraysia and none in Western Australia. Hull rot is weather-driven, and the amount of disease observed was influenced by differences in rainfall between regions and seasons.

LLD was more prevalent in the Riverina, Riverland and Sunraysia with less in Adelaide Plains and very little in Western Australia. A greater degree of LLD was observed in the second season.

Trunk diseases were more prevalent in Adelaide Plains, Riverina and Western Australia compared to Riverland and Sunraysia.

In the first year of the survey, Adelaide Plains had less shot hole than the other regions. This may be due to smaller orchards allowing more effective spray coverage. However, in the second year, this observation was reversed with shot hole having increased in the Adelaide Plains but less prevalent elsewhere.

Other diseases, rust and anthracnose were observed mainly in Western Australia but were rarely observed elsewhere. In the second season, rust and anthracnose were recorded in Adelaide Plains and WA, and some bacterial spot was recorded in Adelaide Plains, Riverina and Sunraysia (data not shown).

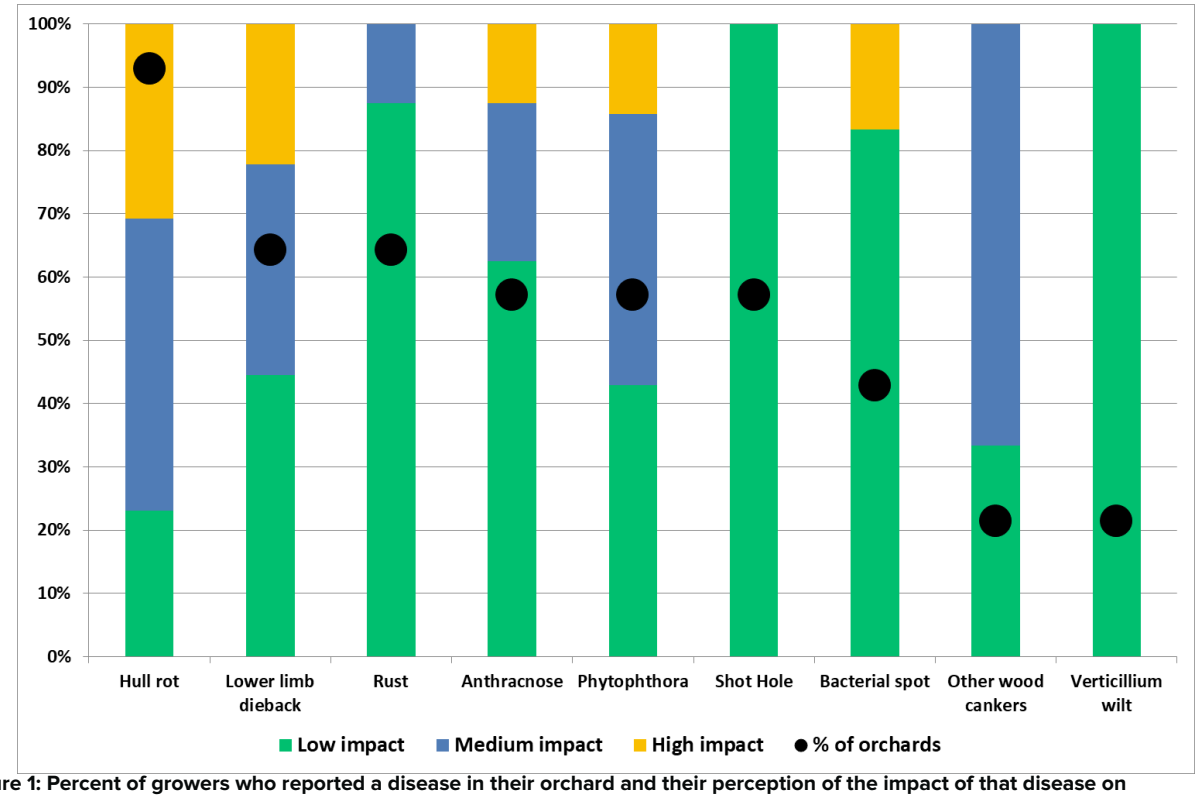

Figure 1: Percent of growers who reported a disease in their orchard and their perception of the impact of that disease on yield from Survey Monkey questionnaire completed in winter 2018.

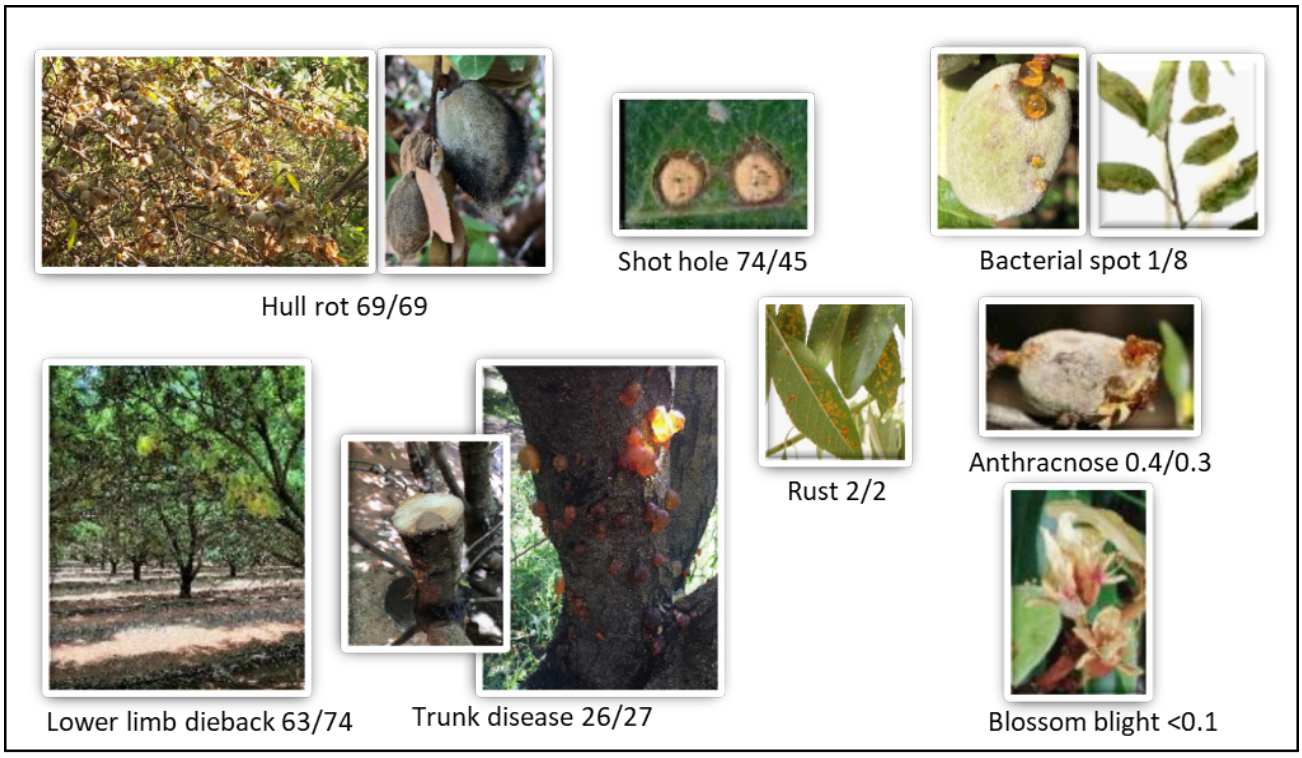

Figure 2. Incidence of almond diseases observed over two seasons. Percent of surveyed trees with disease observed in Year 1 (2018/19)/ Year 2 (2019/20). Hull rot incidence was determined on split Nonpareil trees.
In the survey questionnaire completed in winter 2018, growers perceived anthracnose, rust and bacterial spot as widespread but they were not commonly observed during the orchard survey (Figure 1 and 2).

NEW Fact Sheets available!

Lower limb dieback research update (AL16005) and Phytophthora diseases of almonds (AL16005) are both available for download on the ABA website.

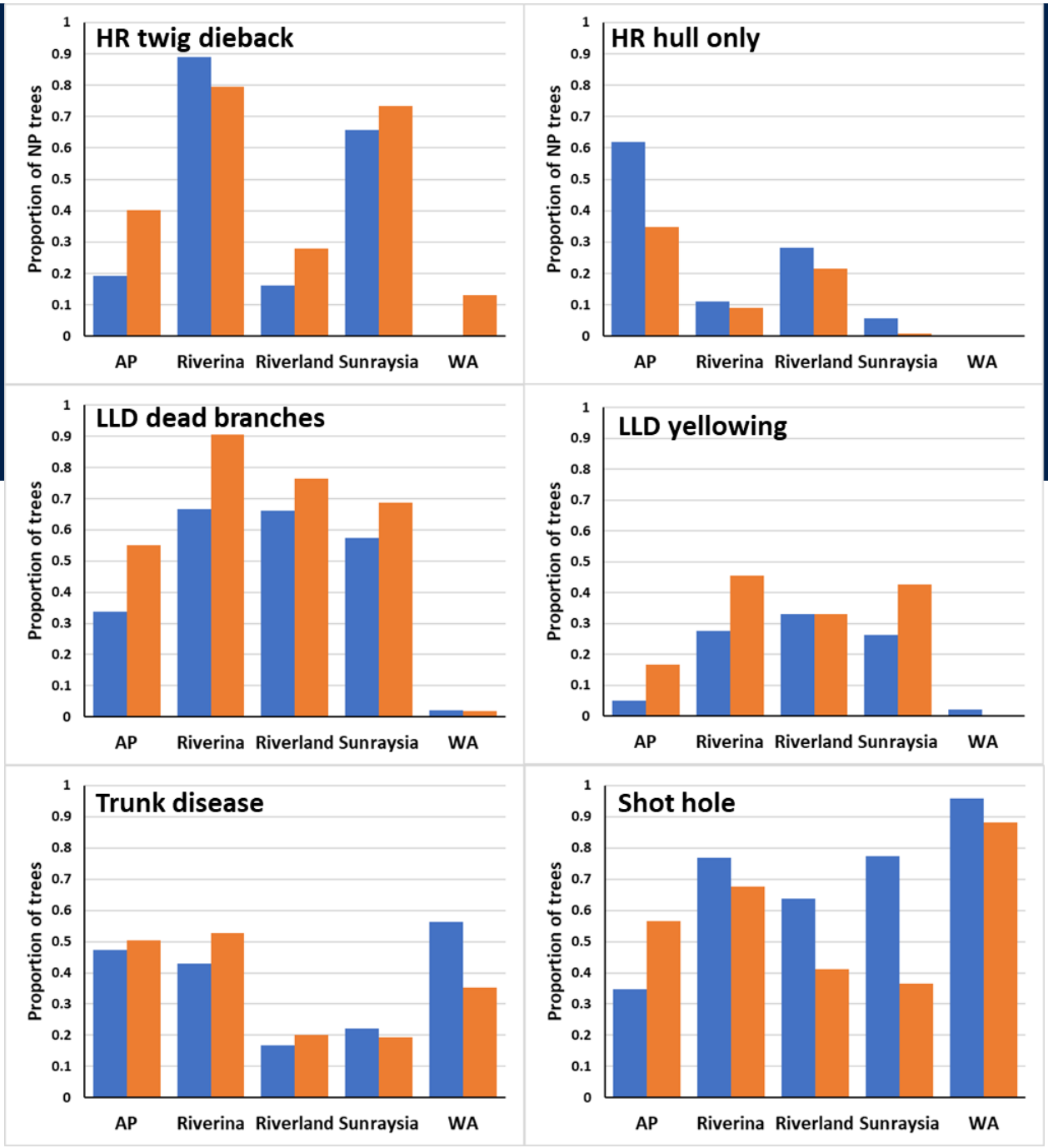

Figure 3. Regional differences for hull rot (HR), lower-limb dieback (LLD), trunk disease and shot hole. HR was measured on split Nonpareil trees only, while other diseases were measured on all trees. AP Adelaide Plains, Year1 Year2

Next steps

This research improves our understanding of almond diseases affecting the Australian almond industry. The data will be statistically analysed and reviewed in consideration of the agronomic practices being used by growers. The results will provide guidance to identify factors which influence disease and assist in the development of future management strategies and practices.

For further information, please visit "Integrated disease management program for the Australian almond industry (AL16005)".

Hort Innovation Strategic levy investment | ALMOND FUND

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Grower review on the Australian bred almond varieties

Ben Wiblin |

ABA Industry Development Officer

The Australian Almond Breeding and Evaluation Program (AL17005), led by Dr Michelle Wirthensohn of the University of Adelaide, originally started in 1997 with a survey that asked growers what they wanted in a new variety. Growers said they wanted: a variety that is self-fertile; could out yield Nonpareil; a kernel that looks and tastes like Nonpareil; a pollinator for Nonpareil; a variety that demonstrates pest and disease resistance; and with a tree structure that is easily managed. A closed shell to prevent kernel staining and eliminate food safety risks was also sought.

After 34,000 crosses and a four-stage evaluation process, the following varieties were made commercially available in 2016: Capella; Carina; Maxima; Mira; Rhea; and Vela in 2017. As of 2019, there are 497 hectares planted to the Australian bred almond varieties and this continues to rise as growers seek their desirable traits.

Recently, 29 growers who have been the early adopters of the Australian bred varieties, were surveyed to gauge their performance in the field. The questions posed were production based including general observations on susceptibility to pest, disease and wind damage, as well as how well they shake, how well they yield and if they were meeting the grower's overall expectations.

The results suggest that growers are largely choosing the Australian bred varieties that are self-fertile, have a sealed shell and strong yielding capabilities. Carina is the early leader based on three or four years of agronomic experience and a limited spread of commercial plantings.

Due to the free exchange of research between the Australian and Californian almond industries, all six of the Australian bred almond varieties have been sent to the Almond Board of California on the condition that they are trialed before release. They are undergoing a 'pre-assessment' to determine which of the varieties will be assessed in trials. So far, Vela and Mira have been the two that the Californians are most interested in.

The conversations with Australian growers revealed one recurring theme relating to the processing and market acceptance of the new varieties. To date, the new varieties have not realised the same premium price that is achieved by Nonpareil. Tim Jackson, the Group Sales and Marketing Manager at Almondco Australia, believes that while the colour of the new varieties is great and the taste is exceptional, it is too early to work out where these varieties sit in the overall marketing strategy.

Tim's key message is, "When picking a new variety to plant, growers should look for an almond that has flexibility in how it can be sold. If it can be sold either as inshell, a kernel or a blanched product, then it is likely to fetch a higher return for the grower".

Tim further advised that as the volume of the new varieties' crops increases, so too will the opportunity to educate consumers about their eating characteristics to create new marketing niches where they may attract a premium. Developing new markets takes time. As current plantings mature and crops expand a critical mass will be achieved enabling the marketers to establish a price for each variety.

To hear from Tim, click here:
https://vimeo.com/445456003/9b4e2b01c0

CARINA - 87%

Carina has been the most widely planted variety, totallying 304 hectares. The uptake of Carina is largely due to its self-fertility, sealed shell and yied potential. In addition, Carina is proving to shake well and have good resistance to pest and disease. Carina received 87 percent in the survey, leading all varieties for grower satisfaction.

VELA - 66%

Vela was released in 2017 and with one less year since commercialisation, it currently sits second behind Carina in terms of area planted with 79 hectares. Vela is a popular variety because of its yielding potential and self-fertility. However, this variety has been subject to some wind damage and breakages resulting in overall satisfaction of 66 percent.

MAXIMA - 81%

Maxima plantings currently occupy 65 hectares. This variety is not self-fertile. However, due to its yielding potential, sealed shell and large kernel it shows great promise to growers. Some initial plantings have been removed due to bacterial spot but growers who have kept their plantings have since been able to manage the disease concern. Those growing Maxima scored their overall satisfaction with this variety at 81 percent.

CAPELLA

Capella has experienced the smallest level of uptake with only 0.48 of a hectare being grown. Growers who have planted Capella chose it for its self-fertility and sealed shell. Due to so little being planted it is difficult to determine its performance.

MIRA - 72%

There are a total of 31 hectares planted to Mira across six properties. Mira is not as early yielding as other varieties and as a result many of the plantings are still coming into full production. This variety will need ongoing observation to determine how it is performing but at this stage growers' overall satisfaction is at 72 percent.

RHEA

Rhea is not a widely planted variety with only 15 hectares currently in the ground. It received the lowest rating in terms of overall satisfaction due to poor scores on 'how well it shakes' and 'current yields' but these are judgements made on a small sample size.

All new varieties, whether they are Australian bred and tested or overseas varieties, have strengths and weaknesses. The ABA will continue to follow the performance of these varieties and provide information as a better understanding of specific agronomic practices under different growing conditions is gained.

For further information on the Australian bred almond varieties, visit the ABA website or contact the ABA Industry Development Officers, Josh Fielke and Ben Wiblin.

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Hort Innovation news

Hort Innovation members to vote on their Constitutional change.

An Extraordinary General Meeting (EGM) of Hort Innovation members has been called and will be held virtually on Friday 9 October 2020 at 1pm AEDST for voting members to consider changing the Constitution of Hort Innovation. These changes relate to:

- All new Directors would be elected to the Board by voting members of the company (Currently, there is a mix of Directors elected and appointed by sitting Directors).

- New elected Directors would have a maximum service period of two consecutive terms of three years, where currently Directors can serve three consecutive terms of three years.

All Hort Innovation members will receive a formal notice of the EGM in September and this will include details of your voting entitlement (same as for 2019 AGM not 2020).

Hort Innovation members can lodge their vote online prior up to 1.00 pm on the 7th October (AEDST) or can vote on the day of the EGM. Full details for both methods are in the meeting notice

2021 Science and Innovation Award for Horticulture

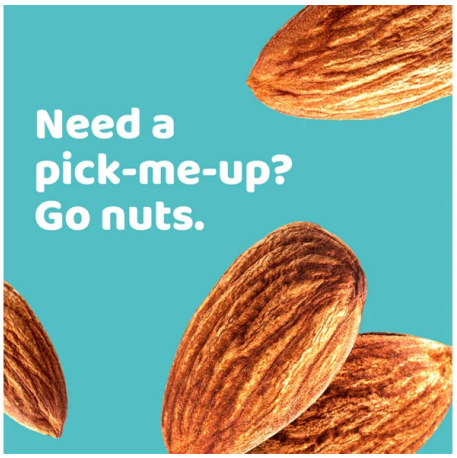
Hort Innovation is partnering with the 2021 Science and Innovation Awards for Young People in Agriculture, Fisheries and Forestry, a competitive grant program for young researchers, scientists, producers and innovators aged between 18 and 35 years that research projects that benefit Australia's primary industries. This year, Hort Innovation is an official Science and Innovation Award partner, offering a grant of $22,000 through the Hort Innovation Leadership Fund, to a young Australian with an innovative research idea for the horticultural sector. The horticulture category winner will also be invited to apply for the Minister of Agriculture, Drought and Emergency Management's Award, granting an additional $22,000 to extend the project.

Applications are now open and close Friday 2 October at 5pm AEST, with winners to be announced at the ABARES Outlook event in March 2021. For more information visit [www.agriculture.gov.au/abares/conferences-events/scienceawards.](www.agriculture.gov.au/abares/conferences-events/scienceawards)

Leadership opportunity for women in horticulture

A number of scholarship grants are available for women in horticulture to participate in courses run by Women & Leadership Australia. Co-funded by Hort Innovation, up to 83 per cent of the program fee is covered and for women working in the apple and pear sector, a number of fully-funded scholarship positions are also available. More information on the program can be found here, and details on how to apply.

Applications close 9 October.



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Calendar

*October

7 ABA Annual General Meeting, via Zoom.

*November

16 ABA Market Development Committee Meeting

17 ABA Board Meeting

ABA Production Committee Meeting - TBC
ABA Plant Improvement Committee Meeting - TBC

NOTE: Dates and meeting formats may change with COVID-19 restrictions in place.

Toasted almond granola

Serves 2

INGREDIENTS

- 3 cups rolled oats
- 1 cup natural almonds
- 1 cup pistachios in shell, shelled
- ½ cup shredded coconut
- ½ cup roasted coconut pieces
- 2/3 cup neutral vegetable oil (e.g. sunflower)
- ½ cup brown sugar
- ¾ teaspoon ground cinnamon
- 1 egg white, beaten with a fork
- 1 cup diced, mixed dried fruit (I used dried cranberries, blueberries and plums)

METHOD

1. Preheat oven to 180 degrees Celsius and line a baking tray with baking paper.
2. Mix all of the ingredients bar the dried fruit in a large bowl until thoroughly combined.
3. Tip mixture onto the baking tray and stir to evenly distribute.
4. Bake for 30 minutes and then check colour. If it's a nice toasted colour you can take it out then, otherwise leave it for another 5-10 minutes.
5. Remove tray from oven and stir in dried fruit until thoroughly combined.
6. Leave to cool and then store in an air-tight container (a large jar is ideal).