

AUSTRALIAN

Citrus News

SPRING 2021



Thinking outside the square

Justin aims for top 10%

P 16

DYNAMIC LANE BALANCER

Infeed optimisation to help meet
your packout goals faster



Apples



Citrus



Kiwifruit



Avocados



Tomatoes



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approximately 10%***

*average number achieved during testing; results will vary depending on infeed, packhouse layout and type of fruit



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AUSTRALIAN Citrus News

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Cover image: Justin Kassulke. Image: Gabby Torpey

OUR CORPORATE PARTNERS





An extraordinary effort by all growers

The 2021 season proved to be one of the toughest on record for the majority of citrus businesses, I have great respect for all of you who had to dig deep – physically, mentally and emotionally – to get through it.

You know better than anyone that the citrus industry can be highly rewarding but also highly demanding, even in good seasons, and I hope you have found time to reflect on your extraordinary effort in 2021. You can be forgiven for not wanting to think about next season just yet. Unfortunately, the labour shortage felt by many this season is very likely to occur in 2022, and potentially 2023, so consideration of all options would be in the best interest of your business. In my view we need to consider labour sourcing labour as a long-term investment, not a season-by-season decision.

Despite the introduction of the Australian Agriculture Visa (AAV) legislation, and its intended access to 10 ASEAN nations, realistically this will not be a viable option for most citrus businesses in season 2022.

Thank you and welcome to our new members

Gooram Valley Orchards
(Finley Park Enterprises Pty Ltd)

Ashmara Pty Ltd

WF Montague Pty Ltd

Valentina Caamano

Oleander Orchards

Twin Lakes Holdings

WA & ND Voigt

Proptec Pty Ltd

Sustainable Farming Solutions

Riverina IPM Pty Ltd

Fruitbuddy Australia Pty Ltd

Swan Hill Chemicals Pty Ltd

Incitec Pivot Fertilisers

Bayer

Juice for Good Pty Ltd

Keenan Produce Pty Ltd

Elders Rural Griffith

AB Citrus Services

There are simply too many (necessary) issues to resolve in the coming months, which does not gel with your need to plan and be comfortable you know where your workforce will come from.

Working Holiday Makers (WHM, backpackers) will start returning next year from selected countries, but not in the numbers we have been used to. There is also going to be immense competition for these workers from the hospitality sector throughout the country. The recent piece rate decision, where a floor price will be added to the Horticulture Award, may also make WHM a less attractive option.

I encourage all businesses to investigate the newly reformed Pacific Australia Labour Mobility (PALM) scheme, which has combined and improved the Seasonal Worker Programme (SWP) and Pacific Labour Scheme (PLS). The consolidated PALM scheme will launch in April 2022 and be managed by the Department of Foreign Affairs and Trade (DFAT).

One of the key changes to the scheme is more flexibility in moving workers across farms, making it a more viable option for smaller businesses. Workers from the Pacific Islands have not been considered a viable option by many smaller businesses in the past but it is worth considering it not only for next season, but as a viable long-term option for future harvests.

I know I don't employ workers on farms, and deal with what you do on a day-to-day basis, but I encourage you to consider both the PALM and AAV as long-term strategic solutions to your seasonal labour workforce. Talk to reputable labour hire companies about organising arrivals and also how they work around the difficulties of the program. You may also consider whether the time is right to look at accommodation on your farm, or purchasing housing in town, even though this may not have been needed in the past.

The accommodation could house a core group from the PALM scheme, or those coming under the AAV in future years.

Citrus Australia also has an eye to the future and is preparing a program to improve education opportunities, and employment pathways, in the citrus industry, and wider horticulture.

Currently there is a huge demand for skilled and semi-skilled staff but not the responding pull through of students looking for careers in our industry.

Our plan is to not only inform high school and tertiary graduates, as well as teachers and parents, of the career and lifestyle choices a career in citrus can provide, but also to offer industry assistance to the education sector where needed.

Citrus Australia is formulating plans to link with secondary and tertiary education programs to showcase the diverse range of jobs available through the citrus supply chain; TAFEs to promote study opportunities in horticulture apprenticeships; and, growers and citrus businesses to develop internships, providing a conduit to industry experience and potential apprenticeships.

We look forward to sharing more of this work with you in 2022.

It's worth noting that many of the issues we have faced in 2021 are temporary. The demand for Australian citrus is still strong in our export markets and supply chains and sea freight issues will resolve themselves in time. We will continue to apply pressure where needed to help these issues along.

NATHAN HANCOCK
Chief Executive Officer,
Citrus Australia



The 2022 Citrus Tech Forum heads to Queensland

Citrus Australia has announced the 2022 Citrus Technical Forum will be held on Queensland's Sunshine Coast on March 8-9, 2022.

Following border closures and restrictions the Forum scheduled for March 2021 was canceled. With recent easing of restrictions based on higher vaccination rates the industry's flagship event will return.

The two-day event will be held at the Twin Waters Novotel Resort Sunshine Coast - 15 minutes from the airport - with enough accommodation on site for all delegates.

The Forum is expected to attract in excess of 350 people from the citrus industry and supply chain.

The program will be broad, with a range of topics covering technology improvements on farm and postharvest including the latest on R&D from Australia and around the world. Speakers will provide a forecast of the trading and supply chain implications for the 2022 season and beyond.

Session topics will include:

- international citrus research and development
- protecting agrichemical availability
- orchard best management practice
- biosecurity challenges
- advances in pest management
- markets and logistics

The event will also place a premium on networking, with extended breaks, to enable delegates time to catch up in depth after such an extended absence.

Citrus Australia CEO, Nathan Hancock, said the event will provide growers an opportunity to come together after a particularly tough year for the industry.

"2021 has clearly been a very challenging year - mentally, physically and financially - for those throughout the industry, but particularly growers.

"We are excited to share updates on new R&D and technology with our delegates, particularly after an extended break between Forums, but also really pleased to provide this opportunity to bring the industry together."

Key points

- ❖ Tech Forum March 8-9, 2022
- ❖ Extended networking opportunities
- ❖ Citrus Australia AGM and member event March 7, 2022

Following our last successful Tech Forum held in Adelaide in 2019, the event will provide growers and packers with a glimpse into future technologies with practical applications and provide a platform for researchers to showcase their work.

With the support of our event sponsors we will also include displays of new equipment and products and services by commercial companies.

The format of the event will encourage growers to participate in a relaxing setting.

Visit www.citrusaustralia.com.au/events for more information, as well as tickets and special accommodation rates.

AGM and Citrus Australia members' event

The 2022 Annual General Meeting will be held at the same venue as the Tech Forum, on the Monday evening, March 7, 2022. This will be followed by a special event exclusive to Citrus Australia members.

The event will be free to Citrus Australia members. Members can RSVP by calling the Citrus Australia office on (03) 5023 6333.

The Citrus Australia Board and management value member participation at the AGM highly, as it helps chart the direction of your peak body. We hope to see as many members at the AGM and VIP event as possible.

Visit www.citrusaustralia.com.au/events for tickets and special accommodation rates. ●



The two-day event will be held at the Twin Waters Novotel Resort at the Sunshine Coast - 15 minutes from the Sunshine Coast airport - with enough accommodation on site for all delegates.

Novotel Twin Waters, Sunshine Coast.

Citrus Australia advocates for industry on rising sea freight costs

The impact of sea freight pricing and pandemic-affected logistics has affected returns and profitability for all growers this year with concerns there is no change in sight for 2022.

After a strong year in 2020 where labour shortages and loss of the hospitality trade were key concerns for Australian growers, the pandemic had a new twist for industry with significant impacts felt through the markets caused by shipping and supply chain issues.

Global shipping lines predicted a downturn in sea freight demand and began to decommission small and inefficient boats and concentrating on building mega liners to modernise the fleet.

“What we now know is quite the opposite occurred,” Citrus Australia CEO Nathan Hancock said.

“All indicators are that consumer spending went through the roof, putting huge demand on ships, especially on the east west route between China and the USA,” he said.

Australia is a very small market in global shipping terms and despite an increase in freight to most Australian ports it was insignificant in global terms.

“Sea freight is a boom or bust industry and prior to the pandemic there had been a number of years of poor performance and low levels of investment,” Nathan said.

“To attract shipping lines to Australia the government developed Part X of the Competition and Consumer Act 2010, which provides immunities for shipping lines from the competition provisions of the Act contained in Part IV.

“This allows shipping lines to register agreements with the registrar of liner shipping and shipping operators may discuss and fix prices, pool revenues and losses, coordinate schedules and engage in other conduct that would otherwise breach Part IV provisions.

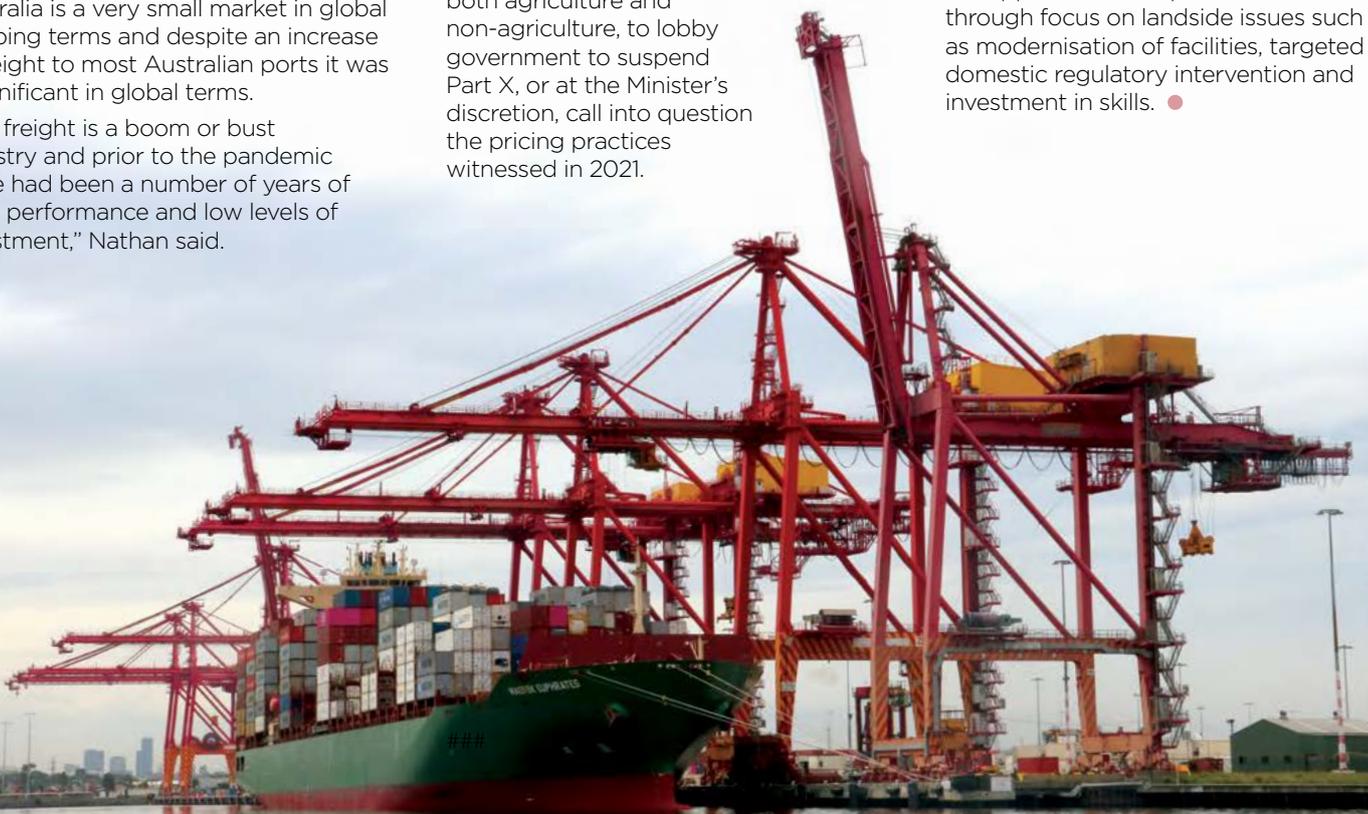
“Part X was conceived when shipping was a marginal investment and incentives were required to ensure smooth exports of goods from Australia.”

Citrus Australia has been active in raising the issues with Federal Government Ministers, including joining a coalition of 30 industry associations, both agriculture and non-agriculture, to lobby government to suspend Part X, or at the Minister’s discretion, call into question the pricing practices witnessed in 2021.

Among its requests, it has asked for the taskforce to:

- Review the level of market competition and examine market conduct of domestic and international firms in the freight industry
- Assess market constraints of international freight supply chains, including bulk sea freight
- Use case studies to assess the cost of delays and cancellations to exporters and affected businesses
- Determine reforms in port services and identify potential initiatives or programs that would promote increased competition.

Although there are many global factors at play which are largely out of the Australian Government’s control, there are opportunities to provide relief through focus on landside issues such as modernisation of facilities, targeted domestic regulatory intervention and investment in skills. ●



Citrus Australia welcomes Australian Agriculture Visa

Progress is being made on the regulation behind the Australian Agriculture Visa (AAV) however Citrus Australia CEO Nathan Hancock says growers should consider other options when planning labour in the 2022 season.

“There’s no doubt that the visa will be a long-term solution to securing a permanent workforce for our industry, and we are pleased to be providing input in to the negotiation,” Nathan said.

“However, we’re concerned that for growers who need workers in April next year it would be difficult to see all of this bedded down and operational in time.”

Nathan said that at time of writing there was yet to be a country that has negotiated a bilateral agreement with Australia to send workers.

“This is understandable, there’s a lot to be negotiated, both within Australia between government and industry and then with other interested countries,” he said.

The visa will initially be open to applicants from 10 ASEAN countries and will be available to skilled, semi-skilled and unskilled workers.

“In time that will extend to a wider range of countries, and there are



benefits in having a broad range of skills permissible under the visa, but it adds complexity to the negotiations,” Nathan said.

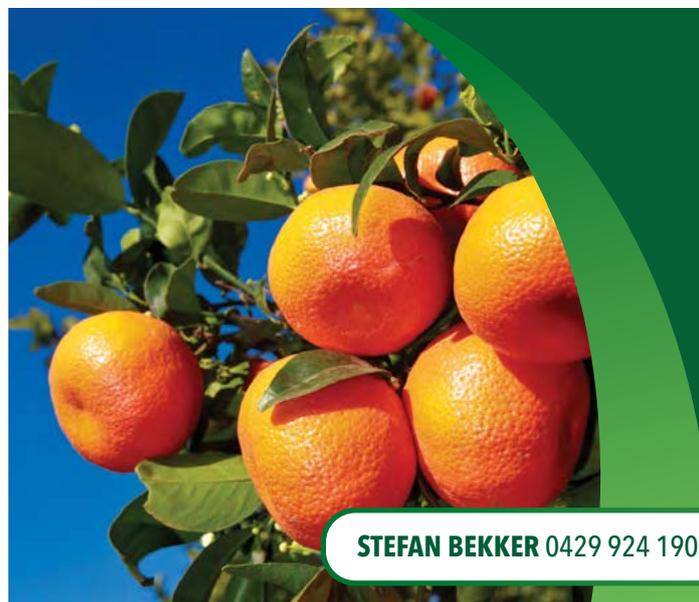
“Citrus Australia sees the agriculture visa as an important component of a reformed and sustainable agricultural workforce.

“Structural change to the horticulture workforce is imperative to the future growth of our industry.

“The agriculture visa not only provides confidence to our citrus growers to continue to invest in their export programs, but enables them to focus on attracting returning workers to their farms and pack sheds, leading to increased efficiencies in their business.

“We are confident the proposed visa will complement the Seasonal Worker Programme and Pacific Labour Scheme, which remain vitally important to the citrus industry.

“We are working hard to make sure the ag visa provides another avenue, particularly to smaller citrus businesses, to recruit skilled, semi-skilled and unskilled workers, and provides incentive to invest in them.” ●



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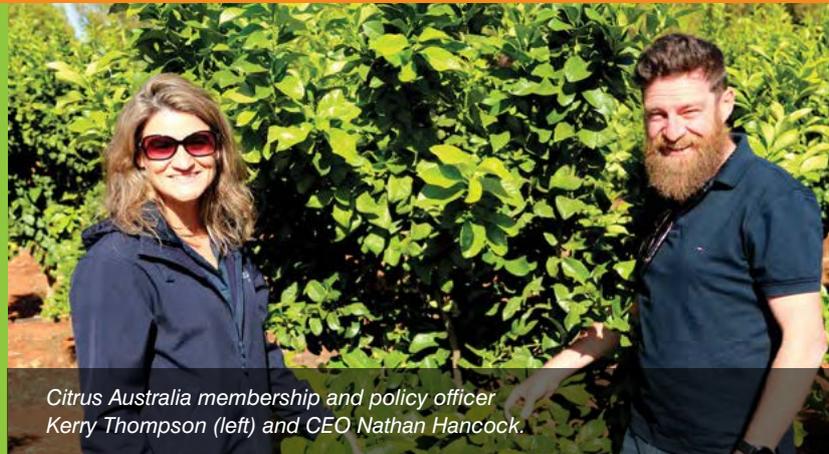
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Citrus Australia membership and policy officer Kerry Thompson (left) and CEO Nathan Hancock.

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Access the Juice, the monthly member only newsletter that benefits your business

For more information visit www.citrusaustralia.com.au, call (03) 5023 6333 or email office@citrusaustralia.com.au



Floor price on piece work rates major disruption for citrus industry

The Fair Work Commission has ruled a floor price on piece work rates under the Horticulture Award is required, following a hearing in November between the Australian Workers' Union and the National Farmers Federation, who led the case on behalf of the horticulture industry.

The Fair Work Commission has introduced a floor price on piece work rates under draft amendments to the Horticulture Award, following a hearing in November. The hearing was in response to an appeal by the AWU who called for a floor price to be added to the piece rate award. The National Farmers Federation and others argued on behalf of the industry. Citrus Australia supported arguments in defense of the current piece rate.

"The result is bitterly disappointing. In my view the Commission entered the hearings with the decision already made," Citrus Australia CEO Nathan Hancock said.

"It was disappointing that the Commission heard from many growers who use piece rates successfully, and also workers who return each season and testified to the financial benefits of this system.

"We thank the citrus growers who testified before the Commission at the hearings. It was a service to industry to put yourselves on the stand and to stand up for our industry, so we thank you for your efforts."

There is no date yet set for when the decision will come into effect, however based on comments by the FWC it can't be earlier than the late January 2022.

Citrus Australia is working through the result to determine the full impact on individual businesses.

There will be a two-week probation period for new employees but it is unclear how this will be enforced. Citrus Australia will continue to inform our grower members through letters and the member-only newsletter, The Juice.

Key points

- ❖ Industry overburdened by new regulations
- ❖ Enforcing existing legislation the answer

The draft changes will mean additional work for businesses, as they will be required to place additional time into the management of new staff to ensure they provide value for money, and moving them on if not, as well as logging each hour and comparing every bin or bag filled of every worker.

"Perhaps the most disappointing aspect is that changes will have little effect on worker exploitation, because it will not change the behaviour of the minority of businesses working outside the law.

"However, it will add an extra layer of management to the vast majority of businesses already abiding by the increasing amount of regulation brought on by state and federal governments.

"Instead of streamlining the piece rate system, the decision will mean further red tape for our businesses."

The Commission's decision relies on

evidence of non-compliance with the current Horticulture Award. Citrus Australia condones all businesses – primarily contractors – who do not pay the regulation award to pickers.

"I have been disgusted at the language centred on the exploitation of workers by our industry that was used by the AWU in the hearing and in the media since.

"Citrus Australia will continue to promote the fair treatment of workers by the vast majority of our industry through our social media channels and in media interviews."

Part of our advocacy to the federal government will centre on a national register of contractors and significant, additional funding for:

- A. Education materials on how to implement the Commission's decision;
- B. Federal resources to pursue incidents of underpayment from those businesses determined to exploit workers and stain the industry. ●



An excerpt of the decision:

The Full Bench expressed the view that the existing pieceworker provisions in the Horticulture Award are not fit for purpose; they do not provide a fair and relevant minimum safety net as required by s.134 of the Act. The Full Bench was satisfied that the insertion of a minimum wage floor with consequential time recording provisions in the piecework clause is necessary to ensure that the Horticulture Award achieves the modern awards objective.

Australian Tree Crop Map: improving surveillance, traceability and KCT auditing

Remote sensing of citrus orchards continues to evolve and present additional opportunities to benefit growers and the industry as a whole.

Growers heard more firsthand at the Southern Queensland Regional Forum in October, when members of the University of New England's Applied Agricultural Remote Sensing Centre (AARSC) spoke about the Australian Tree Crop Map (ATCM) via Zoom.

Senior Researcher, Craig Shephard, said Phase 2 of the ATCM project involved developing a specific citrus map. Growers and industry can utilise the imagery-based map (www.une.edu.au/webapps) to view citrus orchards and tree crops.

No personal or commercial information is captured, it is simply the location and extent of the crop.

Craig said building the map requires satellite, airborne and street view imagery, but fieldwork is also required and the project team has asked all growers to help inform the map, using tools available in the site, which can be accessed on mobile phones. Growers will be able to see if their property has been properly identified and mapped, and rectify any errors. "You can't break it, so please view it," Craig said.



Key points

- ❖ Remote sensing tree crops
- ❖ Maximising mapping technology
- ❖ Benefits range from on farm to national data

Citrus Australia CEO Nathan Hancock says this collaboration will assist growers and industry with a range of great outcomes. "The information this baseline mapping can provide is essential for innovation and advancement of industry, surveillance for exotics as well as improving traceability in the event of a pest incursion or food pathogen issue.

"I see improvements in audit times for export crops and there are applications for yield estimates with surprising accuracy at block and farm level," Nathan said.

Citrus Australia is working with the AARSC to enhance the citrus component of the Australian Tree Crop Map Dashboard.

Dr Angelica Suarez, UNE, explained the integration of yield forecasting with national mapping, and of the positive relationships between canopy vigour to yield and fruit size. Although influenced by location, season and variety, the accuracy of this approach is quite high. Utilising this approach, growers could gain early forecasted yield (Jan-Feb of the current season), with no need for fieldwork.

There is also potential to integrate spatial crop data with other systems to help make decisions relating to industry biosecurity.

As a part of CitrusWatch, the recently launched industry biosecurity program, the location of exotic pest trapping is being stored in the Plant Health Australia database, AusPestCheck™.

National Citrus Surveillance Coordinator, Jessica Lye, said by overlaying trap locations with ground-truthed citrus crop data, more informed decisions can be made relating to future early detection surveillance activities, thus improving the chances of detecting an exotic pest incursion early enough to attempt eradication. "This spatial data would also give our industry an important tool for determining how 'delimiting' surveillance should be run, in the case of exotic species detection," Jessica said. "Understanding the limits of exotic pest spread is a crucial aspect of determining the feasibility of eradication."

AusPestCheck™ already includes integration of the UNE mapping data. "This means we are well placed to use this data for surveillance planning as soon as it is created and released."

Nathan said that through the partnership with AARSC and Citrus Australia through the AgVic funded Advanced Citrus Traceability Pilot, Citrus Australia is ground truthing the UNE digital mapping with the National Tree Census.

"It is expected that initially we will be able to create new maps for growers with their KCT export details on the map, which will enable less time-consuming audits for KCT in the future. "Eventually I would like to see live digital maps linked to KCT applications which would further streamline the process," Nathan said. ●

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Innovative traceability project to protect high-value exports

Agricultura Victoria is funding an innovative \$770,000 traceability pilot for high-value exports, which will be led by Citrus Australia.

The funding is part of the Victorian Government's Food to Market program, announced by Minister for Agriculture Mary-Anne Thomas.

"The Food to Market program is an excellent example of how we are providing timely support to agribusinesses impacted by the pandemic, while capitalising on opportunities to expand into new markets over the longer term," the Minister said.

The Citrus Australia project will utilise leading tracing technology, isotope testing, cool-chain tracking and orchard mapping to enhance traceability.

Citrus Australia CEO Nathan Hancock said the aim is to safeguard the industry from fraudulent activity and ensure the integrity of high-end citrus exports is protected.

Australia exports more than \$500 million of citrus each year to over fifty countries.

"By participating in this pilot, we have the opportunity to work through the

Key points

- ❖ Applying emerging tech
- ❖ Isotope testing for country of origin
- ❖ Online crop mapping platform

real world application of emerging technology on farm and through the supply chain," Nathan said.

"We hope to further progress the integration of traceability into the everyday operations of citrus businesses in the future, whether they be farm to customer marketing, proof of origin or tracing a biosecurity outbreak."

The pilot project comprises three components, one of which will build on the successful traceability project led by Citrus Australia last year.

That pilot traced fruit from Nu Leaf I.P. orchards in Mildura, through

the Mildura Fruit Company (MFC) packhouse, and on to international consumers.

Nathan said the new project would further integrate traceability technology at MFC, utilising additional automation to reduce human data entry. Unique serialised GS1 Digital Link-enabled QR code labels will be added to both bags and cartons of fruit making them traceable by sales unit from end to end.

MFC General Manager Perry Hill said MFC was committed to protecting both the fruit its growers produce and the brands it exports from counterfeiters in overseas markets.

"We see the introduction of unique labelling to our cartons and bags as a critical step forward in our overall protection efforts," Perry said.

"The acceptance of QR Codes around the globe through the pandemic, provides a unique opportunity for marketers to enhance the customer experiences across all products and markets, and fresh citrus is no exception.

"The adoption of this technology by MFC and the wider citrus industry, provides opportunities for direct and targeted marketing, to show our customers the conditions under which the fruit is grown, and locations where the product they are buying is sourced.

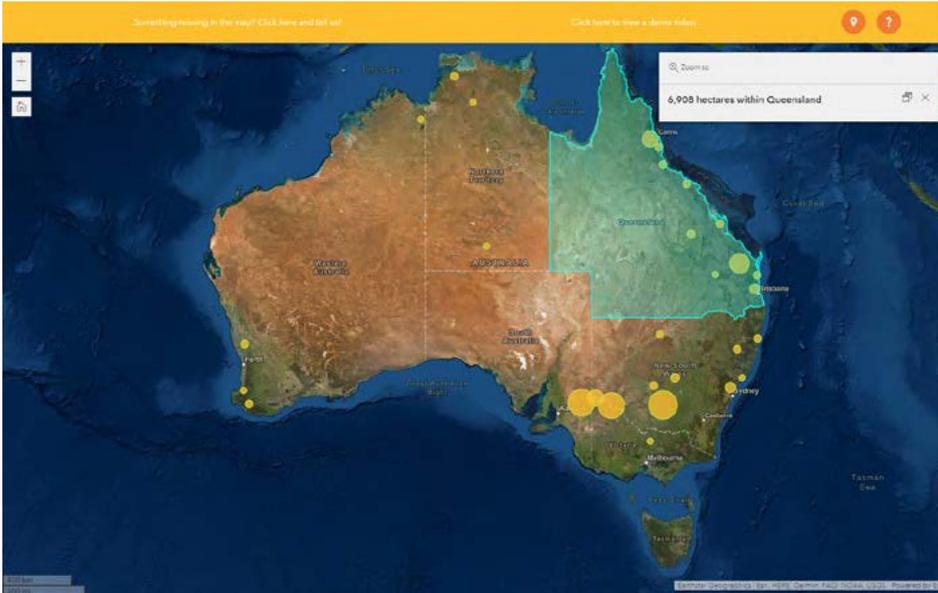
"Tracing the product back to its source provides the customer with knowledge and comfort, to make informed buying decisions about the authenticity and provenance of the product."

GS1 Australia will incorporate its traceability standards into the project, enhancing the international compatibility of these supply chains for global exports.

"GS1 standards enable organisations to identify, capture and share information smoothly, creating a common language that underpins systems



The project will undertake origin traceability analysis of Australia's navel oranges from different growing regions to develop protocols to identify mislabelled fruits in export markets.



Citrus map: an 'industry specific' map which value-adds the essential information, including block ID, variety, age, etc. to support traceability across the supply chain.



Citrus Australia CEO Nathan Hancock.

and processes all over the world," GSI Australia Chief Customer Officer, Marcel Sieira, said.

There is also an additional emphasis on increasing the scan rate by overseas consumers. A marketing campaign for premium fruit brands and varieties will be utilised to raise customer awareness.

"In a way the pandemic has assisted our cause here in that people are far more familiar with using QR type codes to access information, so we hope to see a significant increase in scan rates across the supply chain," Nathan said.

In addition to protecting Australian export brands through the innovative labelling of boxes and bags, the pilot project will include isotope testing of Australian fruit.

"What isotope testing will enable is the ability to differentiate place of origin of Australian citrus fruit using science to prove provenance down to the individual farm and region," Nathan said.

"It not only protects them from deliberate food fraud, but can provide evidence in disputes from export partners on MRLs, and domestic and international claims of food borne illness."

The isotope testing component will be conducted by New Zealand isotope science specialists, GNS Science.

GNS Science Senior Environmental Scientist, Dr Karyne Rogers, uses

"Digitising the mapping will help improve the traceability to farm for biosecurity and food fraud related issues and is a step in understanding the flow of citrus from farm to packhouse to market."

- Nathan Hancock, CEO, Citrus Australia

stable isotopes and elemental analyses to understand the transfer of atoms from soil, water and air.

"Navel orange traceability technology compares the different soil and nutrient derived elements from each farm that are infused into the orange flesh during its growth," Karyne said.

"The project will undertake origin traceability analysis of Australia's navel oranges from different growing regions and compare results with navel oranges from other countries.

"The goal is to determine country and regional specific attributes which can distinguish the origin of navel oranges and develop protocols to identify intentionally mislabelled Australian fruit domestically and internationally."

The third component of the project is the further development of a national online crop mapping platform, which will improve both the accuracy of Citrus Australia's national crop figures, and traceability.

Citrus Australia will work with the University of New England (UNE) to enhance the citrus component of the Australian Tree Crop Map Dashboard, which was recently awarded first place at the global Esri User Conference,

the world's largest event dedicated to geographic information system (GIS) technology.

Craig Shephard, Senior Researcher at UNE's Applied Agricultural Remote Sensing Centre, said traceability requires farm-level information.

"We are supporting Citrus Australia to build an 'industry specific' map which value-adds the essential information, including block ID, variety, age, etc. to support traceability across the supply chain," Craig said.

"Importantly, all information populated in the map by Citrus Australia will be secure under strict sign-in access and is not shared with any other third party or partner."

Nathan said: "Digitising the mapping will help improve the traceability to farm for biosecurity and food fraud related issues and is a step in understanding the flow of citrus from farm to packhouse to market.

"This sets us up well to track and trace issues across the supply chain and is a good model for other industry interactions such as nursery, food waste and transport and logistics when associated with our industry." ●



Lifting profile through social media

Moora Citrus is becoming a household name in Western Australia since enhancing their social media platforms to engage more consumers.

Moora Citrus and their packing business Northern Valley Packers have active platforms on Facebook, Instagram, Twitter and LinkedIn. Their maximum audience is on Facebook with over six thousand followers and 5 thousand likes.

Sales Manager of Northern Valley Packers, Damien Guthrey said they saw the potential in social media being able to engage with their end consumers.

“But we didn’t fully understand when we first got into it, exactly what that meant and the resources it would need. To do social media well, you’ve got to be constant and disciplined in it.”

Damien said they struggled in remaining active during their peak harvest season when their resources were stretched.

“Due to the seasonal nature of the business that we’re in, our presence in the off season is less than what we need during the period of our harvest when our products are out on the

Key points

- ❖ Socials focused on consumer
- ❖ People and faces most popular
- ❖ Consumer feedback influences marketing

shelf. It led us to the decision that ‘ok we’re better off bringing somebody else in from outside to help us manage that’.”

Like anything in their business, Damien said if they were going to do it, they were going to do it well and for their business it made sense to bring in a third-party consultant.

“The amount of followers that we have has increased significantly since we took those steps and again, it’s something that does take a fair bit of

resources to do properly.”

Social media has had a major impact on Moora Citrus including an increase in brand awareness and customer loyalty.

“I think we see value in there, we use that platform just to show people where they can buy our fruit. We also use it to educate our consumers about our brand and how they can distinguish our brand. A lot of things are around our sticker.”

The social media platforms devote time to educate consumers to look for the Moora Citrus sticker when purchasing produce, to differentiate the brand from others.

“Social media allows you to communicate this direct to the consumer and not rely on an intermediary.”

As a result, the social media has increased brand awareness and also customer loyalty, with more consumers telling the team at tasting sessions that they purchase Moora Citrus exclusively.

Moora Citrus do not sell product directly through their social media channels so Damien admits it can be very difficult to figure out what the return investment is.

“That being said, I think the majority of people recognise the importance of social media. It is such a prevalent technology in the lives of everybody these days.”

While the Moora Citrus content is targeted at consumers, social media content for Northern Valley Packers is designed to target a different audience.

“Northern Valley Packers is more targeted at retailers, like IGA stores and independents because Northern Valley Packers is a business brand, not a consumer brand.”

Overall, Damien said posts that receive the most engagement from audiences



Social posts from Moora Citrus..





*Damien Guthrey, Sales Manager,
Northern Valley Packers.*

tend to be the ones with people and faces in them.

“I think people want to engage more with people and their stories rather than just a photo. The other one we throw out there as well is usage ideas to try and generate consumption.”

To create customer loyalty, Moora Citrus use social media to receive feedback from consumers and generally respond to questions within the day.

“If people are commenting on posts, sending you messages we try to get back to them that day.

“We don’t want to leave that lag two or three days, or sometimes a week, which is what happened when we were doing it ourselves. These are important things that fell away.”

Moora Citrus often receive feedback on their platforms from consumers, with their most common question asked, ‘where can I purchase Moora Citrus from?’

This prompted it to create content focusing on showing consumers where to buy their fruit.

“Similarly, we have received feedback about packaging that reinforce the

broader trends in the sustainability space.”

This prompted the company to investigate packaging consumption seriously. It has since become members of Australian Packaging Covenant Organisation (APCO) and are working to reduce the amount of packaging used as well as inform consumers of the correct way to dispose of its packaging using the Australasian Recycling Label (ARL) logos.

Damien said using a third-party consultant made sense to their business model, but it also had the added benefit of bringing in a fresh perspective.

“To have someone look at your business from outside of your business is a different perspective than what you see sitting in the business. It is something they specialised in and all the back of house details that you need experience in to actually understand came to the table straight away.”

The social media team use demographic insights and target posts to cater to specific groups across different platforms including seasonal updates, tips and usage ideas. It has utilized Hort Innovation’s Harvest to Home platform, which provides insights to growers about consumer purchasing habits.

This information shows that senior and established couples are the most prominent buyers in the citrus category, which supports the demographic trends Moora sees on its social media platforms. ●

**Unsure about social media?
Here are a few starters from the
Moora team**

- Start simple and build from there.
- Share posts which interest you and are relevant to the industry.
- Follow and interact with like-minded businesses.
- Put out content which people want to see and connect with.
- Use bright and colourful images to grab people’s attention when scrolling through their feed.
- Avoid harsh filters which alter images too much from their original.
- Post content which is relatable and personal.
- Keep captions short and succinct and use relevant hashtags.



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“Get out of your own little dung hill”

Murray Valley grower Justin Kassulke has an overriding philosophy that underpins his management technique.

“You’ve just got to question everything you do and don’t be afraid to think outside the square.”

Justin is a partner and manager of citrus and wine grapes at Cross Farms in Curlwaa, NSW. He is a third generation farm manager and now also owns his own property under J. W. Kassulke.

Cross Farms is located just across the Silver City Highway from the Murray River that divides NSW from Victoria.

“Our property is quite unique in the soil types that we’re on.

“It makes us a lot different to most but arguably more challenging, but every property has its challenges,” Justin said.

Justin said Curlwaa is renowned for producing fruit with high sugar levels

Key points

- ❖ Heavy clay requires different approach
- ❖ Organics essential
- ❖ Strives to be top 10%

because of the land but also because they typically grow on a tri rootstock.

“We’re heavy clay, not your typical citrus soil so it requires a different sort of management skills, different rootstocks and varieties as well.”

Justin said varieties with external and internal colour seem to do reasonably well in Curlwaa and they predominately grow varieties such as

late navels and Ruby Grapefruits.

“We are a bit of a fruit salad, we used to have more varieties, but we did get rid of them.”

Despite this, Justin said Curlwaa grows good eating quality fruit and they’re always looking at the option of one day being paid for the internal quality of their fruit.

“We really can’t compete with the guys on the red sand hills growing the massive crops with the perfect fruit.

“We can’t quite grow the yields, but our returns are still pretty good,” Justin said.

The farm is on a drip fertigation system but because of the soil, Justin waters down to about 30cm and only fertigates twice a week.

“We don’t have any issues with leaching as far as leaching nutrition so we generally only water down to about 30cm because that’s the extent of what top soil we’ve got.”

Justin said they apply a lot of organics, which are a huge part of their growing system.

“We actually oxygenate all our water through vanturies to try and lift the oxygen levels in our soil. In conjunction with our organics to help with our sudden death and Phytophthora.”

“We’ve really found we’ve got to have our citrus in a wetting and drying pattern, as opposed to other soils which can basically have them on open hydroponics.”

Justin said the farm had a few extreme weather events in November which didn’t help the larger crop load this year, but labour wasn’t as big an issue this year as it was last year when COVID first hit and the borders closed.

“The citrus industry for the last four-five years has been absolutely



Justin Kassulke.

fantastic, the returns have been really good, and now we're probably coming back to a more normalised return.

"Some people's business models might not be able to handle lower returns and none of us like lower returns but with upsides there's always downsides," Justin said.

Justin uses a quote by Northern Territory bull catcher Kurt Hammer to sum up farming: 'Either lead, follow or get the f**k out of the way.'

"You've got to be in the top 10 per cent as growers, you've got to be at least striving to be up there.

"There's the 10 per cent that are doing exceptionally well, you've got the 80 per cent doing the follow, and then the 10 per cent who are in the background who realistically shouldn't be there."

Justin said it's great seeing a new wave of farmers come in with the new generations bringing with them new ideas and old schools of thought leaving with the previous generations.

"The thing about farming is just that it is everchanging.

"I look back at practices that we did

Justin said it's great seeing a new wave of farmers come in with the new generations bringing with them new ideas and old schools of thought leaving with the previous generations.

five years ago, and I thought 'you idiot, why were you doing that?'"

The next phase of farming, or the future of farming means new technology, rootstocks, varieties and markets but the biggest concern for the future, Justin said, is biosecurity.

"We've seen how quickly something like Coronavirus spread around in the world and we certainly don't want something of that magnitude coming into our industry, that's for sure.

"It's a lot easier to stop a problem happening than try and fix a problem," Justin said.

Justin said everyone has got to be on board on biosecurity and everyone needs to be doing a lot more monitoring on biosecurity risks like fruit fly and HLB.

"We can grow a good product or a really good product, we've just got to

make sure that we keep market access open and get into new markets and work on protocols and things like fruit fly, fullers rose weevil and all those types of things," Justin said.

Justin said he's been lucky with the resources and services around him like Mildura Fruit Company to access knowledge that keeps him one step above the game.

Justin stays aware of issues through grower meetings and information sessions but said sometimes some of the best ideas come from other growers.

"Things like drought and low water irrigation, potential fertiliser shortages, covid and all those sorts of things make you rethink everything you do.

"Get out of your own little dung hill and go and see what others are doing." ●

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Planting for the future

Wayne and Nikki Voigt are excited about the future of their family farm after their son decides to take on the family business.

Wayne and Nikki Voigt are owners and operators of their fourth generation, 32 hectare wine grapes and citrus orchard in a little place called New Residence between Loxton and Moorook, in the Riverland.

Wayne has worked on the farm since 1980 and run the business with Nikki since 1993. Nikki has only recently become full-time.

“We don’t employ any permanent labour at all so it’s just Nikki and myself working the farm,” Wayne said.

Nikki says: “It is just a lot of constant work for a vision which is to keep it growing and sustainable. Wayne is amazing at what he does.”

“But I couldn’t be out there without Nikki supporting me in the office,” Wayne said.

The couple started a replanting program in 2009-10 and grow mid, early and late-season navel oranges, Cara Cara navels and a patch of Tarocco Ippolito blood oranges.

Wayne said they like planting something a little bit different than just a normal navel.

“We also keep an eye on what the Arnolds are doing down the road. If they’re planting it, it must be good,” he said.

The pandemic and border closures did not affect the business in 2020.

“As far as we were concerned it was a case of ‘what pandemic?’ We just carried on business as usual,” Wayne said.

.....

After getting all their oranges picked last year, Wayne and Nikki maintained constant contact with their contractor for the next season. Wayne was assured everything would be fine right up until the month before harvest.

“There was no communication back after numerous texts and phone calls. That was stressful.”

Key points

- ❖ Succession planning
- ❖ Overcoming labour shortage

The Voigts pack with Nippy’s, who recommended contacting their contractor and their early navels were picked on time.

The Voigts organised additional labour through the Pacific Labour Scheme (now Pacific Australia Labour Mobility scheme), which was organised through Venus Citrus, which enabled them to get through the rest of the season.

“Venus invited all of the growers to attend a meeting and hear what the outcomes of labour shortage meant. We put our names down for six Islanders, not knowing how it was going to work.”

Nikki said they were very blessed with the pickers they got, and they will be looking at using them again next year.

“We loved every one of them. They were so thankful, and we were so thankful,” Nikki said.

Their two sons said years ago they weren’t interested in taking over the family farm. However, their youngest son and his family have made the decision to move back to the farm to carry on the family business.

“We’ve started our succession planning and we’re working on a plan moving forward,” Wayne said.

“It’s all pretty exciting. They’ve got a son, our grandson, so you never know he might be the sixth generation.”

Nikki said they want to get it right in terms of setting their farm up for the future.

continued page 21



Wayne and Nikki Voigt.



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“Some farmers don’t survive the third generation for various reasons, so by doing succession planning you’re getting the expert advice for guidance towards good outcomes, with the hope of allowing a fifth generation,” Nikki said.

.....

from page 19

“Some farmers don’t survive the third generation for various reasons, so by doing succession planning you’re getting the expert advice for guidance towards good outcomes, with the hope of allowing a fifth generation,” Nikki said.

Although the property is land locked, the property has supported Wayne and his family for generations, and even though they cannot grow more citrus, they are working on ways to make their business more sustainable.

“In those years Wayne has been able to continue to expand and now we’re looking at netting, saving water, and our son has already mentioned solar panels.

“He has another whole spin on it. It will be exciting to include the mind of youth and look at technology, and also to have someone for Wayne to bounce off and work with, instead of working on his own.

“It’s exciting times, it really is,” Nikki said. ●



Wayne and Nikki Voigt’s orchard in New Residence.



Citrus Australia membership works both ways

Wayne and Nikki became Citrus Australia members this year, seeing it as an important component of planning for the future.

“We always thought we were members and then it turns out we weren’t, so we thought we better sign up,” Wayne said.

“We have certainly had a lot of help over the years and we’re happy to be members. We’ve had various discussions with the team already,” Nikki said.

Since Nikki took on her full-time role on the farm, she’s been able to focus

on issues affecting the industry and has taken up opportunities to support the industry through Citrus Australia.

“Especially with labour, I think that was one of our biggest concerns this year, and just knowing what was being fought for, what was going to court and then the outcomes of that,” Nikki said.

Nikki said the Freshcare training conducted by Citrus Australia has also helped.

“The team helped us get our heads around what needed to be completed.” ●



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CitrusWatch: expanding pest surveillance

Biosecurity helps us understand what the risks are to our primary production and provides a systematic, risk-based method of protecting these assets. It supports the health of ecosystems, reduces the need for pest management, and keeps our food supply chains reliable and resilient.

While it may not be the most exhilarating conversation starter, it is one that needs regular air-time in our industry to minimise the risk of exotic pests. In this article we share an overview of CitrusWatch, a new industry biosecurity program that will help to keep this conversation going and help protect industry, businesses and regional communities into the future.

Thanks to our biosecurity system, and our geographic isolation the Australian citrus industry is free from many harmful citrus pest species, affecting other countries.

We know from other countries' experience that huánglóngbīng (HLB), also called citrus greening, has devastating effects on citrus production. After huánglóngbīng was detected in Florida in 2005, production decreased by 74 per cent.

In the 2003-04 season, before HLB was discovered in the state, Florida

produced 242 million boxes of oranges and 40.9 million boxes of grapefruit. In 2020-21 production declined to 52.8 million boxes with a University of Florida economist recently predicting further reduction over the next decade at the current rate of tree replacement. In real terms, this means growers have gone out of business, and millions of dollars have been put into management systems to keep businesses viable.

In recognition of biosecurity threats such as huánglóngbīng, and building on previous biosecurity projects, a new five-year biosecurity program, 'CitrusWatch' has been launched. This program is funded by Hort Innovation through the citrus R&D levy and funding is also supplied by Plant Health Australia (PHA) using the citrus plant health levy. The program is led by PHA, with Citrus Australia coordinating program activities. The Northern Territory Department of Industry

Tourism (NT DITT) and trade and research group Cesar Australia, will provide surveillance, communication and research support.

CitrusWatch will be a collaborative, national program that will extend its reach from commercial production zones, to high-density, high-risk, high traffic urban and peri-urban regions, to support an early detector network both within the industry and throughout the general public more broadly. It will link with biosecurity agencies, biosecurity programs in other industries, and research and extension programs. Ultimately, the program will aim to ensure that the Australian citrus industry is better equipped to minimise the entry and spread of high priority pests, such as Asian citrus psyllid (*Diaphorina citri*), African citrus psyllid (*Trioza erytreae*) and diseases such as huánglóngbīng. The industry will retain access to key markets by collecting robust surveillance data, having surveillance mechanisms and expertise in place to quickly detect, identify, and address incursions of citrus high priority pests.

A breakdown of the program is included below.

Expanding our surveillance

Instances of early exotic pest detection have frequently demonstrated the benefits of early action during an incursion, and the example of citrus canker detection and subsequent eradication in the Northern Territory is a very recent reminder for the citrus industry.

Thanks to efforts from previous biosecurity coordinator, Jeff Milne, and many other contributors, 2018 - 2021 saw an exotic pest sticky trap network take shape that established the start of a network for early detection of some of the citrus industries high priority pest threats.



Lisa Brassington; Rohan Anderson, setting traps.



CITRUS WATCH

Protecting Australian Citrus

.....
The Citrus Watch logo will become familiar to many over the course of the project.

Through Citrus Watch, this early detector network will continue and expand. The program aims to deploy 1000 sticky traps each year across urban residential areas and commercial citrus orchards to aid in early detection of Asian citrus psyllid, as well as other high priority threats, such as African citrus psyllid and glassy winged sharpshooter (*Homolodisca vitripennis*), vector of the pathogen *Xylella fastidiosa*. While early pest detection is the major goal of the program, these surveillance activities have the added benefit of increasing communication and awareness and adding to an industry dataset that can provide 'evidence of absence', since we are collecting valuable data, such as location, trapping dates, and host plants.

Once traps are collected from the field in spring and autumn, they are sent to diagnosticians for initial screening. Suspected exotics are sent to the relevant state biosecurity agency for further diagnostics. The early detector sticky trapping network is coordinated between the NT DITT and Citrus Australia, with the former focussing on Northern Australia and the latter focussing on southern Australia. We are currently in the midst of spring trapping. Over 300 sticky traps have been mailed to early detectors throughout southern Australia and of these, approximately 150 have already deployed in the field (in urban and commercial growing areas). Collected traps are beginning to find their way to experts for screening.

Surveillance in urban areas

Large port-based urban areas are high-risk potential entry points for exotic pests such as Asian citrus psyllid. The good news is there are many eyes and a lot of goodwill in these areas that can help us with early detection.

During the program, sticky trap surveillance in high density urban areas, particularly those near major ports of entry, will be a focus. This spring we will start targeted surveillance for exotic psyllids in the Greater Melbourne region. Collection of bud stick samples through CitrusWatch will also occur, with these samples tested for huánglóngbīng through the project "Improving diagnostics and biosecurity for graft-transmissible diseases in citrus (CT17007)", led by Dr Nerida Donovan at the NSW Department of Primary Industries.

Industry training

The CitrusWatch program also has an industry training component. As the program progresses, we will collect information on what our industry needs, which will serve as a basis for developing training packages and information resources specific to industry needs.

Resources include information materials designed to increase the level of familiarity with high priority, high impact exotic citrus pest species. The more growers, crop scouts, packhouses and nursery managers aware of exotic species and how to recognise them, the higher chance of finding an exotic pest in the early stages of an incursion, when pest population levels are low and contained to a specific area. This early detection scenario significantly improves the likelihood of achieving an eradication.

Face-to-face workshops on pest surveillance and identification will also be organised, where domestic pest and disease experts will share their knowledge. To connect with international expertise on exotic pest species, the program will organise and host two study tours for interested industry members.

Risk assessment and modelling

The industry biosecurity plan (Biosecurity Plan for the Citrus Industry - Version 3; PHA, 2015), which can be found on the biosecurity page of the Citrus Australia website, underpins biosecurity preparedness. Resources and funding can only stretch so far, and the biosecurity plan provides a valuable basis for planning priority preparedness activities for the industry (such as our sticky trap network). Importantly, the plan includes a detailed risk assessment that considers the risk of exotic pest entry into Australia, the risk of a population establishing, the risk of spread throughout growing regions, and the economic impact to the industry.

Due to the work involved, development of industry biosecurity plans is a significant undertaking. The biosecurity plan is due for review, therefore it will be included as an early activity in the program. Another activity will be modelling the Asian citrus psyllid risk of entry, spread and establishment based on available biological and climatic data. Modelled predictions will be important in helping us design future surveys based on the highest risk of location and timing of pest entry and spread.

Governance and collaboration

The Citrus Pest and Disease Prevention Committee, and a representative from Hort Innovation, is acting as the Steering Group for CitrusWatch and will play a key role in the direction of activities in the program over the next five years. CitrusWatch will also strongly collaborate with the recently launched Australian Centre for International Agricultural Research/Hort Innovation project

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'Preparedness and management of huánglóngbīng (Citrus greening disease) to safeguard the future of citrus industry in Australia, China and Indonesia'. This project is being led by Dr Jianhua Mo from New South Wales Department of Primary Industries and involves multiple international and domestic collaborators. Several activities in this project will have direct benefits for Australian citrus growers, such as testing of Asian citrus psyllid attractants and trap types overseas, and a training campaign on huánglóngbīng preparedness.

Keep an eye out for further details about upcoming training opportunities offered through the program as well as an update on sticky trap and targeted surveillance activities in later issues. If you wish to get involved in CitrusWatch as a sticky trap program participant please get in touch with Jessica Lye at Citrus Australia at Jessica.lye@citrusaustralia.com.au ●

Dr Jessica Lye is the National Citrus Surveillance Coordinator with Citrus Australia.



CitrusWatch is a collaborative, national program that aims to protect the Australian citrus industry from harmful exotic pests. CitrusWatch has been funded by Hort Innovation, using the citrus research and development levy and contributions from the Australian Government. Hort Innovation is the grower owned, not-for-profit research and development corporation for Australian horticulture. Funding is also supplied by Plant Health Australia using the citrus plant health levy. Project partners are Plant Health Australia, Citrus Australia, the Northern Territory Department of Industry Tourism and Trade and Cesar Australia."

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The Australian Small Business and Family Enterprise Ombudsman Bruce Billson is encouraging apple and pear growers and traders involved in a dispute to contact her office.

The Ombudsman can provide growers and traders with information and dispute resolution options, including access to mediation services and produce assessors.

Assessors can address issues such as whether a trader was entitled to reject produce or whether a grower has received the correct payment from the trader.

The Ombudsman's approach is to focus on fair outcomes for growers and traders whilst maintaining good working relationships.

Our assistance team can help resolve disputes that arise over produce transportation and delivery.

Small businesses that need information or help with resolving a dispute can visit www.asbfco.gov.au/assistance/horticulture-code or call the ASBFEO hotline on 1300 650 460.



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Ryan plays his part through setting traps on farm

Riverland grower Ryan Arnold, Pyap Produce, Loxton, SA, takes part in the Citrus Australia coordinated Asian Citrus Psyllid (ACP) trapping program each year.

After learning about Huanglongbing (HLB) and ACP through a conference organized by Citrus Australia five years ago, Ryan took the opportunity to learn more on behalf of his growing region.

After visiting HLB and ACP infected orchards in America in 2019 on a citrus industry study tour, Ryan felt compelled to join the Citrus Pest and Disease Prevention Committee (CPDPC) and the National Citrus Surveillance Committee (NCSC).

“I wanted to be involved and use the knowledge gained through the trip to the USA to be part of the team charged with the responsibility of creating a strong industry biosecurity plan.

“Out of that I have been keen to be involved in the trapping surveillance of ACP so we can be confident that it is not present in Australia,” said Ryan.

Ryan said he sets up around five traps on his farm in spring and autumn, and it’s a minor inconvenience on him compared to the value of the data they get out of it.

“Trapping is important to confirm we don’t have ACP, we have also collected bud stick samples from the trapping locations to test for HLB.

“Confirming its absence allows the industry, through the CPDPC, to formulate plans on keeping both out.

“Also if it shows up it will allow us to enact our plans quickly and decisively to eradicate ACP.

“Jess Lye and the Citrus Australia team have made comprehensive but easy to follow instructions with a pack of all the gear I need to do trapping, and recording is made super easy by using the MyPestGuide Reporter phone app.

“It probably takes me an hour or two to deploy and then collect the traps

and ready them for posting to the relevant entomological service for ID.”

Ryan said, although ACP and HLB are not present in Australia, growers and industry need to be prepared and monitoring for when it is detected.

“As an industry we are fairly sure we don’t have ACP in Australia although Indonesia, Timor Leste and Papua New Guinea, some of our closest neighbouring countries do; it’s just a hop skip and a jump away.

“The trapping I and others conduct is important for all of the citrus industry, not just my business.”

Ryan implores all growers to have a biosecurity plan in place and to source budwood and seeds from certified nurseries, like AusCitrus.

“Take the time to familiarise yourselves with the tree symptoms of HLB and the identification of the psyllid and report any concerns to Citrus Australia or your local DPI.” ●

Seasonal ACP trapping is coordinated through the citrus industry biosecurity program, CitrusWatch. If you are interested in taking part, contact Jess Lye at jessica.lye@citrusaustralia.com.au



Ryan Arnold.

“Jess Lye and the Citrus Australia team have made comprehensive but easy to follow instructions with a pack of all the gear I need to do trapping, and recording is made super easy by using the MyPestGuide Reporter phone app.”

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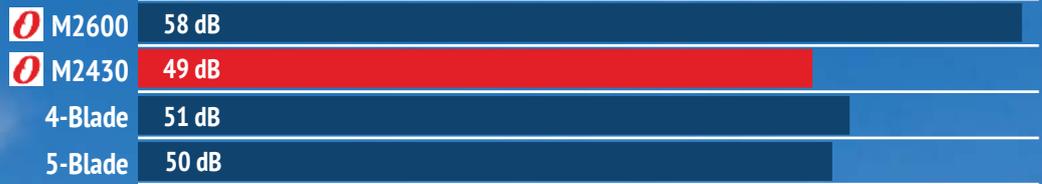
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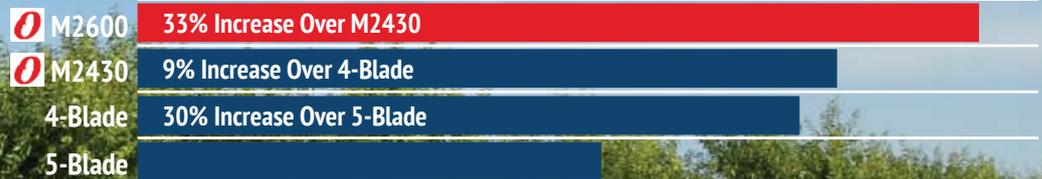
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NEW SILVAN TALL TREE SPRAYER



Silvan Australia has just released the latest addition to its orchard sprayer range with new Tall Tree Sprayer (TTS) now available.

In response to feedback from customers for increased spraying efficiency and effectiveness when faced with the challenge of spraying tall trees such as macadamias, Silvan has developed the TTS to deliver the chemical where it needs to be.

The basis of the TTS is a twin conveyor fan system that is designed to deliver large droplets to the top of the tree yet retain the flexibility to spray smaller trees by hydraulically adjusting the angle of each conveyor. The TTS is available in either 3500 litre or 4000 litre tank capacities.

Other features of the TTS are a fully galvanised steel chassis, choice of Comet diaphragm pump or hydraulic drive centrifugal pump depending on

Developed by Silvan Australia in conjunction with leading growers the new TTS offers significant benefits in efficiency and spray coverage

the application, suspension axle and electric controls with in-cab pressure adjustment. Options include Bravo 180S spray rate controller and flotation tyres.

Silvan Australia's spraying product specialist David Carr says that the introduction of the new TTS is designed to help growers further improve efficiency in their spraying operations.

"In developing the TTS we have taken on board feedback from orchard owners and managers. The challenge they face is controlling pests at the

top of very tall trees and the TTS fan system has been specifically designed to meet that challenge.

"Everyone in the field is driven by improving efficiency and productivity across their entire operation and we believe that the Silvan TTS has the potential to spray effectively at higher ground speeds and in so doing reducing input costs" Mr Carr says.

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The team of scientists on the frontline of disease prevention

On the edge of south-western Sydney, a team of dedicated scientists are working hard to protect the Australian citrus industry from disease.

The New South Wales Department of Primary Industries (NSW DPI) citrus pathology team is based at the Elizabeth Macarthur Agricultural Institute (EMAI), a 1600 ha property within the Camden Park Estate, one of the oldest farms in Australia.

EMAI was established in 1990 and is now a world-renowned biosecurity facility for plant and animal health. The citrus team has access to world class laboratories and a biosecure nursery facility. The labs include a quarantine facility for working on new diseases during an outbreak.

The scientists working with the NSW DPI Citrus Pathology Program include molecular biologists, Grant Chambers and Anna Englezou, who undertake citrus diagnostic research, and Wendy Forbes and Adrian Dando who carry out the commercial activities for the Auscitrus propagation scheme.

Grant and Anna are highly experienced after working with graft-transmissible citrus pathogens for 20 and 14 years respectively; before this Anna worked in medical research for more than ten years.

Key points

- ❖ Enhanced testing for diseases
- ❖ Australian-developed technology
- ❖ World class citrus pathology team

Wendy and Adrian joined the team three years ago but prior to this, Wendy spent two decades building a diverse technical capability in agricultural research and diagnostic laboratories and Adrian brings a wealth of nursery experience to the role.

Vipawee Iamsa-at (Noi) and George Haizer provide valuable nursery assistance. The team is led by Nerida Donovan, who has been working as a citrus pathologist for 22 years.

“The program aims to enhance the ability of the Australian citrus industry to combat disease threats by having

the capability to test for all described citrus diseases, understanding the threats within our borders and making sure industry has access to disease-free propagation material to give our orchards the best start,” Nerida said.

There is a strong focus on graft-transmissible diseases because they can kill trees and there is no cure.

“These diseases are spread in infected planting material, on cutting tools and a few are also spread by insects.

“They may be present in plants without symptoms, but the infected plants pose a risk to healthy plants.

“Therefore, it is essential that we can detect these diseases soon after they enter Australia or in propagation material before its use.”

Detecting graft-transmissible diseases can be difficult because field symptoms may be confused with other disorders, and the pathogen may be present below detectable levels or unevenly distributed within a tree and missed during sampling.

Nerida said it is important that diagnostic tests are specific to the target organism, sensitive (i.e. will detect even at low levels), and efficient in terms of time and cost.

“The team is working on a Hort Innovation project focussed on making sure we know how to test for any graft-transmissible diseases that the industry may face,” Nerida said.

“This includes exotic diseases that are not found here yet, such as the devastating bacterial disease Huanglongbing (HLB), currently wreaking havoc in citrus orchards around the globe, plus other endemic diseases that do exist in Australian orchards and backyards.”

Past work on international aid projects in Bhutan and Lao PDR, has provided



Anna Englezou, Nerida Donovan, Adrian Dando, Wendy Forbes, and Grant Chambers.

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the team with infected plant material, essential for ensuring they know how to test for exotic diseases.

“When a new disease penetrates our border, early detection will be crucial to increasing the chance of a successful eradication campaign.

“The earlier we find a new disease, the greater our chance of eliminating it before it becomes a production issue.”

Detection is also critical for preventing and managing the diseases that are already here.

It is vital that disease-free and true-to-type propagation material is available to industry to prevent these diseases from entering citrus nurseries and orchards.

Use of healthy planting material will avoid potential yield loss and the costly exercise of replanting infected blocks.

The Auscitrus budwood and rootstock seed source trees are tested at EMAI to ensure the supply of healthy material to industry.

New diagnostic methods that were developed or validated by Grant and Anna are then used to test the Auscitrus material.



The laboratory.

Adrian and Wendy also undertake the specialised skill of shoot tip grafting, the only way to eliminate a graft-transmissible pathogen from a new variety prior to commercialisation.

Pathogen-free trees of each variety are then included in the National Citrus Repository; an industry asset that contains disease-free and inoculated trees of more than 260 citrus varieties.

The collection is duplicated at two sites, EMAI and the Auscitrus property at Dareton.

The EMAI nursery also houses a collection of plants infected with viruses and viroids, which is the only way to store these pathogens in

live form, and other plants used for diagnostics or research trials; the infected plants are maintained in separate structures away from the healthy material.

Through industry funded projects, the citrus pathology team has halved the time needed to run diagnostic tests and increased capability four-fold.

They have also developed new diagnostic methods to detect Australian strains of the pathogens because tests developed overseas often miss our variants.

Efficiency of testing has also been improved by ‘multiplexing’, where they find a way to test for more than one pathogen at the same time.

Building a better understanding of the diversity, distribution and risk posed by local diseases is an ongoing component of the work that helps to determine the potential economic impact of these diseases. The team has been working on more than 30 exotic and endemic graft-transmissible organisms posing a threat to citrus.

“Collaboration and mentoring have been of vital importance to building the Citrus Pathology Program,” Nerida said.

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Adrian Dando (Auscitrus Indexing Officer) with Auscitrus Executive Committee member Greg Chislett discussing biological indexing in the EMAI nursery.

“We have been fortunate to work with and receive guidance from local and international scientists.

“Of note are Professor Paul Holford from Western Sydney University and Professor Lester Burgess from the University of Sydney, who have continued to advise and provide encouragement, even in their retirement.

“We hope that we can pay it forward to younger scientists through our current work.”

Working closely with other scientists and with industry, ensures more ‘bang for the industry dollar’ by value-adding to activities.

The team has developed a strong relationship over many years with researchers and surveillance officers around the country and is strengthening national capacity with citrus diagnostic hubs at the University of Queensland and the Western Australian Department of Primary Industries and Regional Development.

Interaction with industry organisations like Auscitrus and Citrus Australia also ensures the Citrus Pathology Program is providing relevant and important support for industry.

“The support given to us by sectors of the industry over the years has been fundamental, such as that provided by Auscitrus Manager Tim Herrmann, and the Auscitrus Executive Committee, and by Nathan Hancock and his team at Citrus Australia,” Nerida said.

Survey samples collected from northern Australia and off-shore by the federal government Northern Australia Quarantine Strategy, and samples collected nationally by the industry-led Citrus Watch program are tested at EMAI for the exotic diseases HLB and citrus variegated chlorosis (CVC).

“This work supports our early warning

system and negative results provide evidence of absence data for these major biosecurity threats, useful for trade negotiations,” Nerida said.

“The samples are also tested for endemic diseases which checks the robustness of our test methods and increases our understanding of how widespread diseases are in Australia.”

The team plays an important role in emergency response; from diagnostics to confirm the identity of the pathogen, to genome sequencing to trace the origin of the infection, to pathogenicity testing to determine the range of hosts the new pathogen can infect, thereby informing decisions surrounding the potential economic impact and the feasibility of eradication.

The team also lends a hand with citrus samples submitted to the NSW DPI Plant Health Diagnostic Service, also based at EMAI.

Nerida works closely with the other members of NSW DPI citrus team, providing pathology input to various projects and extension activities, with the lab team providing technical support when needed.

This includes the Hort Innovation funded National Rootstock Evaluation program led by Dr Tahir Khurshid, and field trials examining interactions between commercial dwarfing viroids and new viroids as part of a Hort Innovation project led by Dr Dave Monks.

Nerida is also a technical advisor on a project starting on HLB in Indonesia, Australia and China. The project will be led by entomologist Dr Jianhua Mo and funded by the Australian Centre for International Agricultural Research and Hort Innovation.

Nerida also works closely with Citrus Industry Development Officers Steven Falivene and Andrew Creek to extend

results and improve awareness of biosecurity issues.

The International Organisation of Citrus Virologists (IOCV), the organisation representing citrus pathologists worldwide, has enabled the team to link and work with experts from around the world.

This network has led to collaborations with the University of California, Riverside on citrus viroids and with Citrus Research International in South Africa on tristeza virus.

Nerida was voted by her international peers to be Chair-Elect of the society and will take over as Chair at the next conference to be held in Mildura.

The conference will largely be organised by the EMAI citrus pathology team and will provide Australian scientists and industry members access to the global leaders working on citrus diseases.

“It has taken many years to build a strong Citrus Pathology team. I feel privileged to work with skilled scientists who all understand the importance of the work we do for industry,” Nerida said.

“Diseases have been known to destroy industries. It is of crucial importance that we have an experienced and multi-skilled biosecurity team to rely upon; one that is connected globally and equipped with the knowledge and tools to protect citrus production in Australia.” ●

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Future population trends of the citrus gall wasp

Since its first detection in the early 2000s, the citrus gall wasp (CGW) has spread rapidly throughout the southern citrus production regions.

In some places, the infestation level appears to be steadily rising, with no signs of easing.

In order to determine the future of CGW infestation in the southern regions – whether numbers will continue to rise or come down after some time – I have developed a preliminary model to predict future CGW population trends.

The model included the effect of CGW's primary parasitoid species, *Megastigmus brevivalvus*, on CGW populations.

Where available, published and unpublished data were used to estimate the model parameters, including the fecundity and sex ratio of CGW and *M. brevivalvus*, and morality of CGW.

Model parameters for which there are no published/unpublished data for estimation were tested as scenarios.

The model produces a variety of future CGW population trends in the absence of any human interventions.

Without the parasitoid, the population is predicted to steadily increase until it reaches a maximal level determined by the capacity of citrus trees and stays at the maximal level afterwards.

With the parasitoid, the population is predicted to drop to a lower level before stabilising or undergoing cyclic fluctuations.

Figure 1 shows future trends of CGW population and parasitism rate under four different scenarios. The four scenarios were separated mainly by the host searching strategy of the parasitoid, with more aggregated searching leading to more stabilised trends.

The duration of the first CGW population peak and the number of years it takes for the CGW population

to stabilise after the initial peak increases with the time lag between the first arrivals of the CGW and the parasitoid (**Figure 2**).

It appears that in most southern regions, CGW populations are still at the initial increasing phase.

The results confirm the importance of parasitoids. Unlike chemical interventions, the parasitoid population increases as the CGW population increases.

As a result, it is able to change the CGW population trends and limit the infestation level in the future.

One interesting finding of the model is that once the parasitoid population has built up sufficient numbers, further releases of the parasitoid are not necessary.

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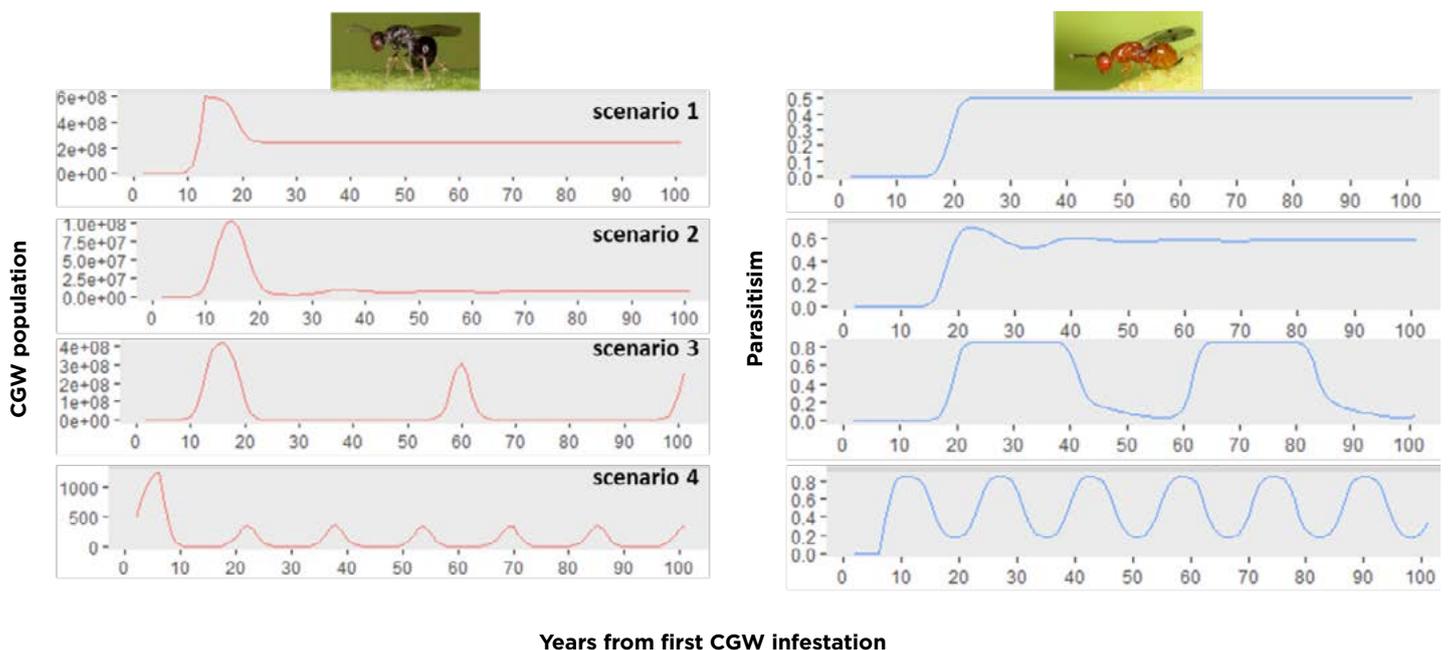


Figure 1. Four predicted future CGW population trends: (1) population peak and then stabilises at a moderate level, (2) population peak and then stabilises at a low level, (3) population peak and then fluctuate with large infrequent peaks, and (4) population peak and then fluctuate with small frequent small peaks.

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The preliminary model is based on our current knowledge of CGW and *M. brevivalvus*. A PhD study is underway to improve our understanding of their biology and ecology.

The new knowledge will be used to update model parameters and improve model accuracy.

The updated model will be used to compare the efficiency of different CGW control strategies including releases of parasitic wasps, pruning, applications of systemic and foliar insecticides, and control thresholds. ●

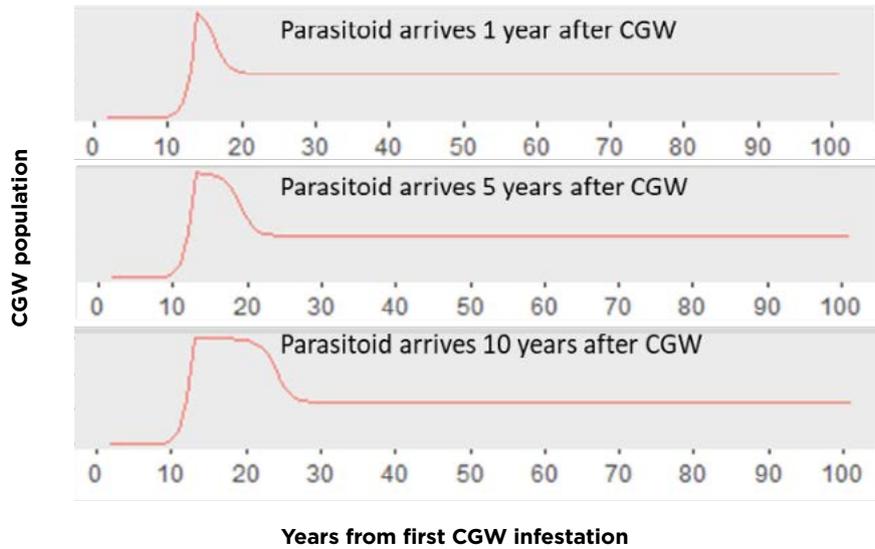


Figure 2. Three predicted CGW population trends assuming the parasitoid arrives 1, 5, and 10 years after the CGW.

Dr Jianhua Mo is a Research Entomologist with the NSW DPI based in Yanco, NSW. You can contact him on (02) 6951 2537 or Jianhua.mo@dpi.nsw.gov.au



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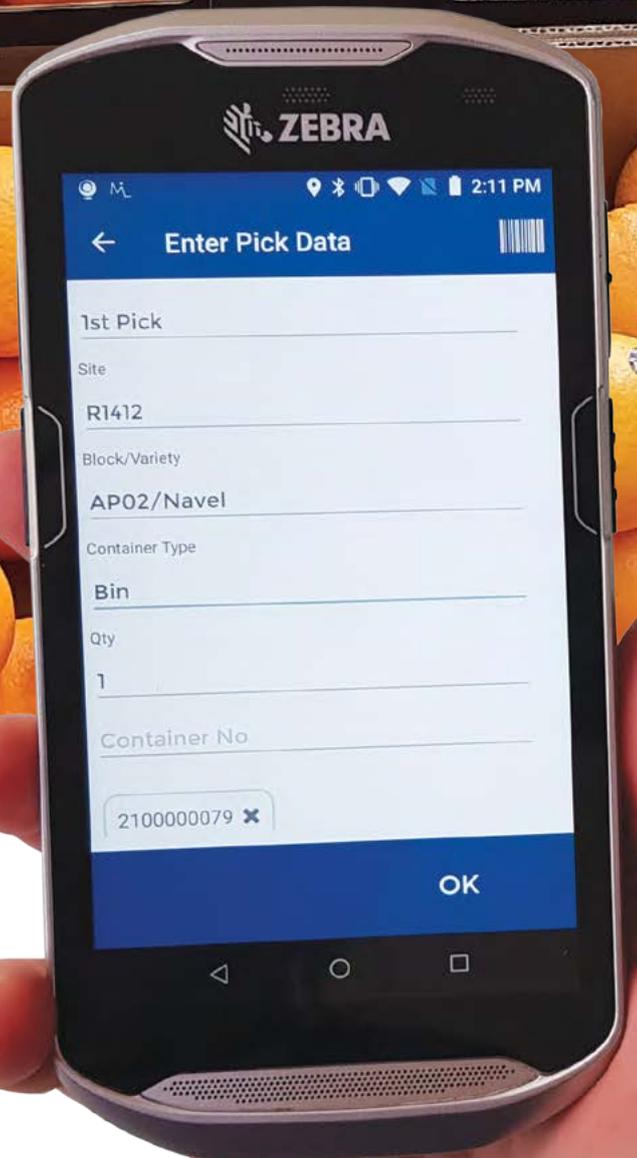
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Improving food safety practices to safeguard exports

A new project focused on food safety in citrus aims to mitigate microbial food safety risks associated with the production, postharvest handling and supply of citrus to consumers in domestic and export markets.

The project will be led by Dr SP Singh and the NSW DPI.

The Australian citrus industry exports oranges and mandarins worth half a billion dollars to the major Asian markets. The success of citrus export is built on the free trade agreements and a clean, green, and safe reputation of the industry.

“Healthy, nutritious and safe’ is the unique selling point that the Australian citrus industry promotes in its marketing campaigns,” Dr Singh said.

“However, the industry needs to be proactive in maintaining the confidence of consumers, regulators and trading partners in the quality and safety of their fruit to ensure the market access is retained, and new

markets are created.

“To remain competitive in the export markets it is imperative that the Australian citrus industry has the capacity to consistently supply safe and nutritious fruit.

“Due to the inedible peel, citrus fruit presents a relatively lower microbial food safety risk to consumers.

“However, any detection of microbial contaminants on the fruit poses a potential ‘trade risk’ and could trigger a non-tariff barrier. Given the current volatility in export markets due to various geopolitical reasons, this risk is significant.”

Dr Singh and his team will engage with citrus growers and packers in all major

production regions to collect data and information relating to the current industry practices on food safety.

This information will deliver a national snapshot of the industry practice and identify potential gaps to be addressed in the short-, medium- and long-term.

The project will follow a whole-of-the-chain approach with strong stakeholder engagement to verify food safety practices and detect potential hotspots for microbial contamination and cross-contamination along the supply chain.

Each link within the supply chain will be examined, starting with field production, postharvest processing and distribution through to retail.



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With the voluntary participation of citrus growers and packers, fruit and environmental samples will be collected from all primary production and supply regions to detect the target foodborne bacterial pathogens.

“I encourage citrus growers and packers to contact me to confidentially discuss their food safety practices and participate in the project to ensure the robust preventative control measures are in place to minimise the food safety risks to consumers and industry,” Dr Singh said.

Dr Singh said there are some unanswered questions on the ability of foodborne bacterial pathogens to survive and multiply during the cold treatment for phytosanitary purposes and other supply chain scenarios in export and domestic markets.

The project will investigate the survival and persistence of the key foodborne bacterial pathogens (e.g. Salmonella and Listeria monocytogenes) on various types and varieties of citrus fruit under simulated supply chain conditions.

The influence of critical postharvest conditions (e.g. storage temperature, cold phytosanitary treatment and



‘Washington Navel’ oranges being inoculated with Listeria monocytogenes for a simulated supply chain experiment in the laboratory.

shelf-life) affecting the pathogen survival will be investigated.

“The experimental data and industry’s food safety practice information will form the basis for developing a scientific evidence-based Best Practice Guide for the industry to understand and manage these risks effectively,” Dr Singh said.

The information pack and Best Practice guidance will be delivered

through various channels of communication such as workshops, forums, meetings and industry magazines to enhance the skills and knowledge of growers, packers and the key staff involved in the supply chain.

“The outcomes of this project will enhance the industry’s food safety capacity and influence the practice to mitigate microbial food safety risks.” ●

More information

This article is a contribution from the project ‘Managing microbial food safety risks in the Australian Citrus Industry (CT20005)’. You can contact Dr SP Singh on 0420 593 129 or email sp.singh@dpi.nsw.gov.au

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Which postharvest sanitisers are best for you?

The last issue of *Australian Citrus News* reviewed the use of postharvest fungicides to control decay during storage. This article summarises the use of sanitisers which are used in conjunction with these fungicides in the packinghouse.

Sanitisers are essential for food safety and kill pathogens on contact in water, but once they are inactivated there is no residual protection.

This is a fundamental distinction to postharvest fungicides, where sanitisers only kill fungi in water suspensions and do not penetrate the skin with little or no control of established disease causing infections.

However, some sanitisers such as peracetic acid (PAA) based sanitisers do have a minor benefit in slowing postharvest decay and their use is important in organic decay management.

Figure 1 shows the incidence of postharvest decay was lower in oranges infected with green mould following PAA treatment (although blue mould was less effected).

However it is critical to note the postharvest decay control was only possible by dipping the infected fruit with the postharvest fungicide, in this case imazalil. Fungicides are essential for postharvest decay control. As mentioned in the previous Australian

Citrus News articles, the continued use of the same postharvest fungicide over time leads to the development of resistance to that fungicide and loss of value.

Fortunately, this is not a problem with the use of sanitisers, as sanitisers have a broad mode of action to kill pathogens and the development of resistance is not possible.

When choosing the type of sanitiser for your packinghouse there are a number of factors to consider, where the best sanitiser is the one that works best for your situation.

Each sanitiser has its own merits and issues of adoption. Factors that influence which sanitiser to choose include price, water source (channel, ground or council), water quality (pH, hardness), packing line machinery (corrosiveness), buyer's requirement, method of application and monitoring (manual vs. automatic), etc.

But it is always important to follow the label guidelines and manufacturers' instructions to ensure correct and safe use of sanitisers at recommended

concentrations and conditions.

In addition, measuring and monitoring the concentration of sanitisers is a crucial for quality assurance and the successful use of sanitisers.

A number of sanitisers with different chemistries are currently available in the market and are registered with the APVMA.

Chlorine-based sanitisers

Chlorine has been a very popular sanitiser for many years across many industries. Chlorine-based sanitisers include (a) sodium hypochlorite, calcium hypochlorite, (b) bromo-chloro-dimethylhydantoin and (c) chlorine dioxide.

Chlorine-based sanitisers - hypochlorite

The use of chlorine such as sodium and calcium hypochlorites as sanitisers in wash water requires active management to monitor the pH, chlorine concentration and sanitation potential of water.

The effectiveness of chlorine as a sanitiser is determined in large part by pH. It is critical to ensure that the pH of the wash water after addition of chlorine should be maintained between pH 6.5 and 7.5.

In addition to the pH, organic load also affects the efficacy of chlorine because active chlorine is neutralised by debris and dirt present in water.

Chlorine concentration and pH can be monitored using paper test strips available from chemical suppliers, but digital equipment is more accurate and objective.

Another indirect measure of the sanitising capacity of water is oxidation-reduction potential (ORP), which can be measured using an ORP probe.

An ORP reading above 700 mV suggests acceptable levels of

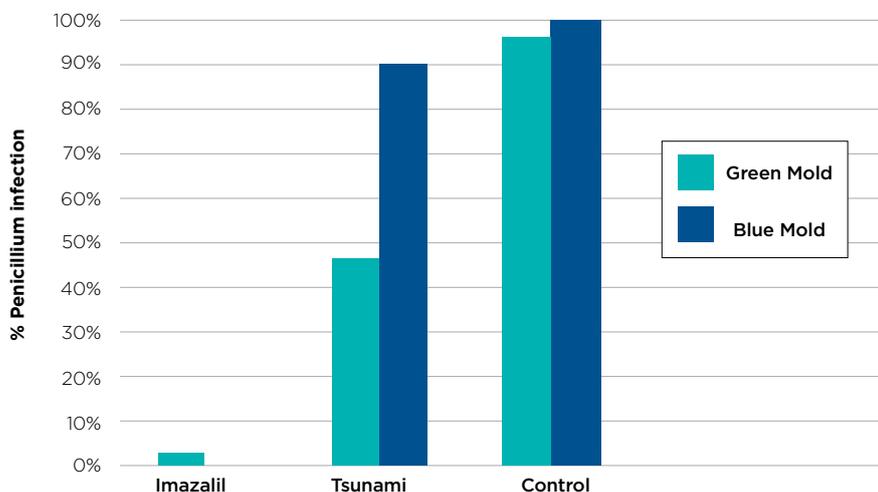


Figure 1. Comparing the infection of green and blue mould in oranges after treatment with PAA (Tsunami®) and imazalil fungicide.

sanitation potential. The impacts of chlorine by-products have been subject to a number of health and environmental reviews but chlorine is a well-used and accepted sanitiser.

Chlorine-based sanitisers - bromo-chloro-dimethyl hydantoins (BCDH)

Bromo-chloro-dimethyl hydantoins (BCDH) are another chlorine-based option as a sanitiser registered with APVMA.

These sanitisers also provide broad spectrum control of microbial pathogens. They represent a unique blend of chlorine and bromine chemistries which provide sanitising activity in a broad pH range especially towards alkaline conditions (pH 7.0 to 8.5).

It is also less affected by organic load compared to chlorine and relatively lower concentrations are required (5 – 10 ppm). Bromo chlorine products include Nylate®.

Chlorine-based sanitisers - chlorine dioxide

Chlorine dioxide is another form of chlorine sanitiser which is currently available in different formulations with a stabilised active ingredient.

Chlorine dioxide gas itself has been used a sanitiser which is dissolved into water but it can de-gas to cause WHS issues.

Stabilised chlorine dioxide is safe to use and because of its very high reactivity and low concentration (up to 10 ppm), less contact time is required for wash water treatment.

It is effective against bacteria, moulds and yeast over a pH range up to 8.5. Organic matter in water does not affect the efficacy of chlorine dioxide and it does not corrode metal. Stabilised chlorine dioxide products include Vibrex®.

Peracetic acid (PAA)

There has been a shift towards peracetic acid (PAA) based sanitisers which has been driven by the management issues associated with chlorine and the environmental impacts of chlorine by products.

PAA is sold in a mixture with acetic acid and hydrogen peroxide to maintain its stability and is reactive and quickly decomposes to oxygen, water and acetic acid (the acid in vinegar). It is very effective against a broad spectrum of fungi and bacteria.

The use of PAA at the recommended concentration (up to 80 parts per million) is effective in reducing microbial load and achieving product sanitation.

Unlike chlorine, it is effective over a wide range of pH and requires less management. However, the effective monitoring and recording of PAA concentrations in wash water is critical as for any other sanitiser and can be done using test strips.

PAA is corrosive and measures to protect machinery (such as drive chains and gears) and workers should be taken if it is used. There are a range of PAA sanitisers such as Tsunami®, Adoxysan® etc.

Iodine

Iodine is an effective sanitiser for water treatment. It can be used over a wide range of pH and the water's organic load does not affect it greatly. Iodine has limited availability for this type of use, is less corrosive to metals and is expensive.

Fully automated iodine dosing and recovery systems are commercially available. For example the Isan® system is equipped with a fully automated computerised control, monitoring and logging system.

It is a closed loop process whereby the process captures all by-products and converts the captured by-products back into the original biocide, providing a clean closed loop process. The main issues are cost and availability however it is used by some citrus packers. Providers of iodine sanitation system include the Isan® system.

Ozone

Ozone is a gaseous sanitiser which can be dissolved in wash water. Ozone is very unstable and quickly decomposes into oxygen and must be generated continuously using an ozone generator.

Ozone is very effective at killing microbial pathogens over a wide range of pH but very reactive and can corrode metal and other surfaces (including packingline machinery).

High levels of organic matter will significantly decrease its activity. In addition it has a pungent smell which can cause throat, eye and nose irritation even over short exposures and has significant WHS issues if not properly managed. However it has successfully been used in some packinghouses.

Electrolysed water

A relatively new sanitation system uses electrolysed water and is currently used in other industries, including vegetable washing, waste water treatment and cooling tower water treatment.

This was discussed in a recent ACN article (Summer 2021, pages 31-33). Electrolysed water is produced by running the wash water through a series of cells and applying an electrical current (electrolysis).

If required, the water is automatically dosed with small amounts of dissolved table salt to increase electrical conductivity. This process produces a range of highly reactive but short lived chemicals.

EW is safe and has been shown to destroy pathogens and chemicals without compromising safety or the environment. While there is a high initial installation cost, a benefit for the use electrolysed water is the ease of use and efficacy where it has been shown to have low maintenance and running costs.

Other sanitisers

There are a number of sanitisers that are used, mainly in the organic industry. These are generally not as effective as traditional sanitisers but are useful in markets which do not use or permit traditional sanitisers.

It is important that when assessing the efficacy of these sanitisers, to note the contact times required for treatment as often these sanitisers require significantly longer treatment times to reach similar efficacy. ●

Acknowledgements

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Dr John Golding is a research horticulturist with NSW DPI.

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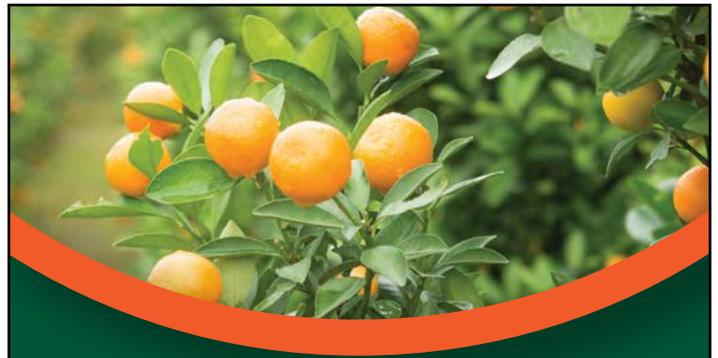
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