

# Impact Update



People, natural resources, communities and thriving businesses are core to the sustainability of Australia's \$16 billion horticulture sector which is why **Hort Innovation has more than \$80 million in investments underway** to support industry in its sustainability goals.

This edition of **Impact Update** tells some of horticulture's sustainability story, taking a deep dive into Hort Innovation's key investments, as well as good news stories from growers who are on their own sustainability journey.



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## Telling horticulture's sustainability story

Grower groups from across Australia and national representative bodies have jointly supported a newly released *2024 Australian-grown Horticulture Sustainability Framework* that will help the horticulture sector share its sustainable, ethical, and safe farming practice stories with stakeholders.

Developed through Hort Innovation, this resource equips growers to proactively manage sustainability now, and in the future. Hort Innovation worked with more than 600 stakeholders to deliver the Framework, which promotes sustainable and responsible care for our natural environment and provides

a vital roadmap for a stronger Australian farming future.

The Sustainability Framework has identified four areas significant to the sustainable production of fruits, vegetables, nuts and amenity horticulture in Australia:

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# AUSTRALIAN-GROWN HORTICULTURE SUSTAINABILITY FRAMEWORK

## Nourish & Nurture

Healthy, nutritious food  
Greenlife  
Safe, traceable, quality

## People & Enterprise

Productive, profitable growers  
Human rights  
Safe work  
Diversity & capability  
Governance  
Thriving communities

## Planet & Resources

Sustainable agricultural practices  
Water  
Biodiversity & pollinators  
Biosecurity  
Pest & disease management

## Climate & Waste

Emissions  
Energy  
Climate adaptation  
Food waste  
Waste

🌱 **Nourish & Nurture** recognises the role of Australian horticultural produce in improving diets, health and wellbeing by providing safe, quality food and greenlife.

🌱 **People & Enterprise** identifies the strong links between the people, enterprises, communities and economic value of Australian-grown horticulture.

🌱 **Planet & Resources** focusses on sustainable agricultural practices by reducing any impacts on the natural environment and on the dependence of horticultural production on resources, biosecurity.

🌱 **Climate & Waste** is about reducing all forms of waste in horticultural production and resilience to climatic variability.

*Read the 2024 Australian-grown Horticulture Sustainability Framework at [www.horticulture.com.au/sustainability](http://www.horticulture.com.au/sustainability).*

# Sustainability quest propels almond R&D agenda

For anyone wanting to know just how seriously Australian horticulture views the importance of sustainable production, they need look no further than the nation's almond industry.



The almond industry long ago recognised that sustainability was not just a hollow buzz word but in fact a guiding principle in its quest to cement a vibrant future for its growers.

Sustainability is very much at the core of the industry's research and development investment agenda, according to Hort Innovation head of sustainability research and development, Kathryn Young.

"It is an industry priority clearly set out in the Almond Strategic Investment Plan (SIP) 2022-26 which is a roadmap to guide Hort Innovation's investment of almond industry levies and Australian Government contributions," Ms Young said.

"Supporting sustainable orchard systems through an integrated approach focused on plant improvement, orchard productivity,

soil health, water use efficiency, pollination, insect pest and disease management, and emerging technologies is the industry's highest priority, as detailed within the SIP.

"This industry priority is the catalyst for Hort Innovation continuing to invest – on behalf of growers – in a suite of R&D programs employing innovative technologies and approaches to equip growers with new knowledge and tools to bolster their sustainable farming practices and long-term viability."

Whole orchard recycling is the focus of one of the investments that sits under the 'pathway to carbon neutral' project theme umbrella.

The project is quantifying the impact of whole orchard recycling on the carbon footprint of an almond orchard, including the impact on carbon storage and turnover in the soil, soil

greenhouse gas emissions and carbon accumulation by newly planted trees.

The information gathered through this project will support almond growers to integrate whole orchard recycling into their orchard redevelopment programs by demonstrating the potential of carbon farming, changes in soil health, irrigation use efficiency and productivity improvements.

Delivered by the South Australian Research and Development Institute (SARDI), the project is assessing any co-benefits from orchard recycling such as more rapid orchard establishment, as well as potential negative impacts such as increased pressure from soil pathogens and potential for nitrogen draw down.

Almond trees accumulate significant amounts of carbon through their trunks, branches and roots during

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“It is about good stewardship of the land; I want my kids and potentially my grandkids to be able to take over this orchard. As a third-generation grower, I would like to see the orchard pass on to five or six generations.

“That is why a focus on sustainability is so important.”

**Neale Bennett**

their lifecycle. When an orchard reaches the end of its commercial life, this resource is traditionally managed through burning as part of the orchard redevelopment.

While burning rapidly clears debris from the site and can reduce pathogen load, it also releases a significant amount of carbon that could potentially be sequestered or at least incorporated to improve soil organic matter and fertility, and help with the establishment and productivity of the new orchard.

The alternative to burning prior to replanting is pulverisation of the perennial portion of the almond trees and incorporation into the soil prior to replanting (known as whole orchard recycling).

Victorian grower Neale Bennett first saw whole orchard recycling in

action in California in the United States some years ago when attending a conference where the multiple benefits of incorporating mulched tree matter into the soil were reported.

“While a couple of growers here in Australia have been mulching one or two rows of old trees, until now there hasn’t been any scientific measurement of the effects on water retention, soil structure, organic matter and carbon levels,” said Mr Bennett, whose family-owned and operated orchard at Merbein is hosting trials for the whole orchard recycling project.

“We need to prove to industry and the wider community that this practice is a viable alternative to burning. We want to grow almonds in an environment where we’re focusing on waste reduction, improving water usage

and improving nutrient application and uptake – not just for the benefit of our production systems but also because that is what society is asking for.

“We are already doing that to a large extent – for instance, we’ve moved from 95 per cent sprinkler irrigation to 99 per cent targeted drip irrigation – but this research will hopefully enable us to magnify our sustainability efforts and the positive impact,” Mr Bennett said.

Another ‘pathway to carbon neutral’ project being funded through Hort Innovation is focused on life cycle analysis in almond orchards.

Led by Edge Impact, this project is undertaking a life cycle assessment of the almond production at the industry level, with the intention of identifying sustainable practices in the industry

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and reducing the production of carbon emissions. This will be executed through:

- Developing future greenhouse gas emission reduction initiatives
- Raising awareness across the industry of its footprint
- Developing the capability of the industry to undertake future assessments
- Helping to position the industry for domestic and international opportunities that may arise from becoming carbon neutral and in the generation of carbon offsets.

Exploration of cover cropping as a management practice in Australian almond orchards is the subject of another Hort Innovation investment.

The cover crops for soil health and productivity project, led by the

University of Adelaide, is assessing the efficacy and practicality of cover crops in specific almond-growing regions for more effective and sustainable orchard management.

The research is seeking to understand how cover crops influence every aspect of the production system and which crops are best to mitigate soil damage, minimise water use, encourage pollinators in the orchard and avoid the need for herbicide addition.

The newest project in the almond industry's repertoire, 'Enabling the pathway to best sustainable management practices', will assist and empower the industry in understanding sustainability risks and support the longevity of Australian almonds as a sustainable, profitable and well-respected industry.

This project utilises Growcom's purpose-built sustainability benchmarking platform, building modules as Almond Hort360. The project will provide the Australian almond industry with a foundation to approach sustainability in a targeted and industry-specific way.

# Yarra Valley Cherries the first cherry orchard to become certified carbon neutral

It is a busy time of year at Yarra Valley Cherries. Their trees are primed with ripening fruit that is almost ready for picking. It has also recently announced that they have been certified as a **carbon neutral cherry orchard** through the Australian Government's 'Climate Active' program, which is a collective initiative for climate action.

Yarra Valley Cherries is the first cherry orchard in Australia to have gone through the extensive process of certification, realising its commitment to significantly reduce its carbon impact.

In welcoming the certification, Yarra Valley Cherries managing director Andrew Fairley confirmed the commitment that the family has to operating more sustainably.



"We are incredibly proud to be the first cherry orchard in Australia to have achieved this certification. Our team has made every effort possible over the last 10 years to minimise our carbon footprint, and this acknowledgement from Climate Active that we are now carbon neutral is important to us, our broader community and the cherry industry."

**Andrew Fairley**

Climate Active is a partnership between the Australian Government and Australian businesses to encourage organisations to voluntarily take climate action. The certification is only available to businesses that go through a process of measurement, adaptation, and have a commitment to continuous improvement.



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## Hort Innovation spoke to Andrew about his carbon-neutral journey and advice to other growers.

### What got you started on this path?

I worked in ecotourism for nearly 30 years, so sustainability is in my DNA. When you are running a business, I believe you need to run it in the most sustainable way possible, so that has been my approach to any business I am part of.

We bought the cherry orchard nearly 10 years ago, and it has been an iterative process of first learning about cherry farming, bringing the orchard back up to a commercial standard, and then thinking about our carbon.

We do everything in the Yarra Valley, from growing to packing, so we immediately started looking for

solutions for a sustainable process. For example, we started reusing fruit that we could not sell to make cold-pressed cherry juices and not throw the product out, and we are currently looking into selling cherry timber for smoking ovens.

When we got serious about becoming carbon-neutral, we started working with a consultant who could work with us to establish our carbon footprint so we could start taking steps to minimise that footprint.

It is a long journey, and it is not inexpensive because you spend a lot of time establishing your carbon footprint. Staff need to go through every invoice to look at the footprint; then, you establish your carbon budget and then work out how you will offset it and reduce it.

We have reduced our carbon emissions as much as possible and invested in projects that reduce or remove emissions from the atmosphere.

Our efforts include the installation of a 15kw solar array, electric forklifts, greater use of natural fertilisers, chipping our prunings and finding alternative uses for damaged fruit.

### What would your advice be to other growers considering their carbon?

What I cannot say to other growers is that they are guaranteed to get higher prices. You do not do this to get a higher premium for your product, although that may come one day. You do it because you are committed to not wanting your business to add to the load of carbon already out there and changing our climate.

The horticulture sector needs to identify that carbon-neutral commitment is getting to the point where it will be the baseline. Carbon-neutral commitment will eventually become what is expected from us.

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The major supermarkets already have a carbon budget they are trying to work to and have to report on. It is axiomatic that within a relatively short time (maybe a couple of years), they will be attracted to producers that do not need to add to their carbon budget because the product is carbon neutral. Yarra Valley Cherries have certainly been a trailblazer in undertaking this work.

### **What was the biggest challenge?**

The sheer weight of information you must collect was a significant challenge. And then came the realisation of how many tonnes of carbon we were emitting – when you work that out, it is a bit scary.

What helped us overcome that challenge was that we had instant

buy-in from our team to embrace sustainability. Our team was enthusiastic to get started and committed to being a beacon of light in the sector from the very start.

I consistently advise the industry to seek more commitment to sustainability and have a view of their carbon footprint. The process that we went through in ascertaining our carbon footprint was arduous and lengthy, but it gave us some terrific information about where our most significant impact was from a carbon perspective.

### **What is next for Yarra Valley Cherries?**

Now that we have our benchmark and know our outputs, we can look at how to minimise our impact across everything we do. Continuous improvement is our goal now.

Electric tractors are something that we are particularly interested in at the moment. We spend a lot of time on our tractors; they are an essential part of horticulture, so that is an avenue we will be keeping a close eye on. They are not currently available in Australia but are in the US.

We also want to continue encouraging the sector to get on board. We have learned a lot from our sustainability journey and want to share that with others.



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### ABOUT YARRA VALLEY CHERRIES

Yarra Valley Cherries is an Australian owned, boutique, premium cherry grower with the aspiration to produce the freshest and highest quality cherries available. Located in Seville in the beautiful Upper Yarra Valley, **it grows more than 30 different varieties across 20,000 trees** ensuring you can buy the best cherries throughout the season.

# Creating a sustainable and autonomous orchard

Bundaberg avocado growers **Austchilli** have established a pilot smart farm to develop new technologies and tools that will help Australian horticultural businesses improve nutrient, water, and labour use efficiencies. **Austchilli** is the largest chilli grower in Australia, it also has avocado orchards. The business is family owned and operated, and has vertically integrated on-site production, processing, and packing.

Avocados Australia spoke to **David De Paoli** from Austchilli and his senior agronomist, **Kaushal Gunasekara**, about their involvement in the pilot Smart Farm project, and why they chose to get involved and be an early adopter of the available technology.

## How have smart technologies improved orchard operations?

**David:** Mostly by providing a means of monitoring the crop health, water use efficiency and nutrient use efficiency in real-time as well as providing a forecast for the next few days in terms of weather and irrigation requirements.

**Kaushal:** I would say there have been some significant improvements in our operations, especially in the areas of irrigation and fertigation. Before the project, we only relied on soil moisture content as the only criteria for irrigation scheduling. With the help of the array of sensors, we are now taking the other factors such as environmental factors, ETc (crop evapotranspiration), plant-based parameters such as

maximum daily shrinkage, and stem growth rate. Further, we are considering the forecast which is provided by the dashboard on plant water usage. We also adjust our fertigation based on those predictions and plant growth patterns.

## Has the Smart Farm improved efficiencies as a result of the smart technologies?

**David:** We have improved somewhat by adjusting our practices. Integrating so many different types of technologies provided us with a better understanding of the behaviours of the crop and provided some understanding of what to expect in the immediate future, while visualising our issues. We are also looking forward to getting the solutions derived from the dashboard by utilising it for the automation of irrigation and fertigation decisions to minimise human errors.

**Kaushal:** We are using a low volume drip irrigation system to minimise water usage as well as to improve water use efficiency. With the system, we can plan

**The project began in October 2019** when Hort Innovation secured a \$2.9 million grant through Landcare's **Smart Farming Partnerships program**, supported by the Australian Government.

better based on the prediction of water use provided by the dashboard as well as the alarms. We also have customised the rootzones that we are interested in based on the age of the crops as well as rootstocks. This provides us with a better insight into the seepage and percolation losses and calibrates our irrigation volumes and fertiliser dosing rates to improve efficiency. We now have zero allowance leaching losses for fertiliser. With our dendrometers, we are monitoring our growth rates and making small adjustments to

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our fertiliser regimes to match the site-specific minor variations of the avocado phenology.

### **Is your farm more sustainable as a result of the Smart Farm technologies?**

**David:** We certainly are moving in the right direction. We always knew there is a problem with not having a holistic approach to optimising irrigation and fertigation. Now we are getting evidence from the dashboard that there are deficiencies in the optimal usage of resources with conventional orchard practices through the sensors and alarms based on the

sensors covering atmosphere, soil and plant-based sensors. We think the automation based on the dashboard will provide a solution to the problem and will create a sustainable system in the environmental as well as economical landscapes.

### **What have been the main benefits of using the Smart Farm technologies on farm?**

**David:** Currently, the biggest benefit we are gaining is real-time monitoring of plant water use, plant stress, the efficiency of irrigation and irrigation water loss. Further, the predictions provided by the dashboard are

utilised to plan irrigation and fertigation planning to avoid potential water and nutrition losses while providing optimal water and nutrient levels for avocado production.

**Kaushal:** The main benefits of the dashboard so far are to have real-time information on tree growth patterns, soil moisture status, weather parameters and most importantly the forecast of irrigation water requirements all in one dashboard.

*This case study was developed by Avocados Australia.*



## Beginning your sustainability journey

**Sonja Cameron** from Cameron's Nursery shares her sustainability journey and advice for starting out on your own.

Our sustainability journey started in 1994 when we ran out of water. Cameron's Nursery was just starting out. This water shortage made us realise the immense value of this resource as we had no options other than a dam. But then it rained, the dam filled, and we moved on. Four years later, it happened again, highlighting that we needed to be more sustainable with our water usage.

Back then, there was not a lot of information available on water sustainability, so we had to do a lot of research ourselves and become innovators by rolling out some practice ideas. Slowly, we found

ways to save water to improve our usage, and that was the start of our sustainability journey.

When we moved sites in 2000, we embedded that approach with our well-designed water recycling strategy. We also started to look more into our environmental impact because other properties, farms, hobby farmers, and residential homes surround us. We are also close to a creek, so we do not want to pollute that water source and negatively impact others downstream. The flora and fauna here are beautiful, and the biodiversity is essential to our business, so we now have a whole range of sustainable practices to protect it. We have found that with sustainability not everything can be done at once.

There are numerous resources available to help transition on a sustainability journey and improve your business footprint. People often do not know where to start, so I suggest thinking through questions like 'What are my pinch points?' 'What is the biggest waste?' 'What has the most negative impact?'. Then make a list and start working your way through.

This approach has been instrumental in bringing us to our current standing. Annually, we provide our staff with a progress report detailing our advancements and setting targets for the upcoming year. This strategy ensures that we remain on course, consistently striving to implement the most effective measures.

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“Every one of us holds responsibility and the potential to advocate for the impact nursery products can have. Whether it is enhancing mental health or mitigating the effects of climate change, our every action exerts a positive influence on the future of our world. However, it is crucial for us to actively propel and promote this message.”

**Sonja Cameron**

Cameron's Nursery is accredited and certified under the key programs of the Australian Plant Production Standard that are Greenlife Industry Australia and levy-funded (NIASA Best Management Practices, EcoHort Environmental Management and BioSecure HACCP Plant High Health).



Being a business owner entails a significant level of accountability, and the report card serves as a tool for this purpose. Sustainability has become increasingly vital for any business due to growing expectations from the community. For instance, consider the scenario of soft plastic recycling in supermarkets – a few years ago, there was minimal discussion on this matter. Presently, encountering a product wrapped in plastic prompts consumers to question whether they should make the purchase. This shift underscores the evolving expectations surrounding sustainable practices.

As part of the green industry, we must sing from the top of the hills how good our product is for the

environment and sustainability, but we must also be practicing it. More frequently people ask about our sustainability practices, especially the younger people as they are concerned about their future. So, as owners of businesses, we need to step up and make sure that we are accountable for what we are doing and respond accordingly.

The future is bright within our industry, but there's a necessity to amplify the message. There's a prevailing lack of awareness regarding the intricacies involved in managing a horticultural enterprise and the diverse skill set required to cultivate a plant and manage the responsible use and conservation of natural resources.

Every one of us holds responsibility and the potential to advocate for the impact nursery products can have. Whether it is enhancing mental health or mitigating the effects of climate change, our every action exerts a positive influence on the future of our world. However, it is crucial for us to actively propel and promote this message.





## Generational farmers looking after land and environment

**A passion to look after their land** drives the Arnold family, of Pyap Produce, at Loxton, South Australia, to continually improve the way they farm.

Ryan Arnold, who farms 100 hectares of citrus with his brothers, near the South Australian / Victorian border, said they were determined to produce quality fruit while looking after the environment.

"We are generational farmers in our family," he said. "My brothers and I have all tried to go away and study and bring information back to the business."

"Citrus is a health-giving product and we are trying to grow good quality fruit for our customers."

Mr Arnold said they worked with a packer to market their fruit and exported between 50 and 70 per cent of their produce.

"Generally, the export categories are more lucrative so we are actually trying to get ourselves to grow more export-quality fruit."

"The customer is more and more connected these days to the food they put in their mouth and the health benefits and the ethical benefits."

He said customers were interested in a range of issues including worker well-being and the environment.

"This generation wants to know how the citrus has been produced and its effect on the environment. Certain markets are more sensitive to this than others and demand this more than others. We farm with that in mind as well because we have a passion to farm sustainably."

Farming in the Riverland region of South Australia is a challenging environment and Mr Arnold said they had implemented a lot of changes to help them be more resilient and add to production.

"The biggest thing we have done in the last five or six years is adding full cover netting to our orchards," he said.

This was originally done to counter extreme wind events and storms which blemished the fruit.

"It allowed us to pack more of a class one product and helped as a hail barrier as well. We had a hailstorm a couple of years ago, and it held up." "It also takes the extremes out of the heat in summer. Looking at climate change we are told there's going to be some more environmental extremes. For us, it is a way to mitigate those extremes."

Netting has reduced solar radiation and wind velocities and allowed an increase in yield per hectare.

Mr Arnold said when they worked back to yield per megalitre, they were about 35 per cent better off with the netting.

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"If we do not have a suite of environmentally friendly, safe products to use we are not going to be able to satisfy our customers as farmers."

**Ryan Arnold**

"That is part of the package," he said. "The netting creates a really nice environment for the trees but also for some beneficial bugs as well."

They were also growing a range of cover crop species inter-row to encourage and harbour beneficial insects which have a role to play in controlling pest species.

"We run an integrated pest management system through our orchard," Mr Arnold said. "We want to encourage our natural populations of beneficial insects such as lacewings and ladybugs."

He said they had successfully released populations of beneficial insects to predate pests such as two-spotted mites and thrips and also reduce the need for insecticides.

"We have a threshold level that we work out so we will always tolerate some pest damage. Once a threshold hits a point where we think it will create significant financial impact, we will then try to work out what chemistry we could spray."

They looked at targeted insecticides that worked on the physiology of the pest but left the beneficial insects in the crop to continue to work.

"We are geared towards a model of trying to be as soft as we can on the environment and encourage beneficials to proliferate while we keep our insect pests at a low level."

Mr Arnold said they were also paying attention to their soils and inputs such as water and nutrients.



"We are focusing more on trying to learn about how the soil can aid us and give us that resilience."

Their drip irrigation system allows nutrients to be applied directly to the target areas and is changed depending on the time of season and the results of soil and leaf analysis.

"We can apply prescriptively to the trees in their root zone. We use automatic controllers to dose the amount and also monitor our moisture levels to make sure we are not pushing those nutrients and water past root zone levels."

Pyap Produce was part of the Corteva Agriscience Climate Positive program which highlights farmers doing the right thing for the environment.

"I think the customer is going to dictate our social license to farm in a way and it is also important to make sure we are science-based, not destroying the environment we are farming in and creating healthy, safe fruit," Mr Arnold said.

"If we do not have a suite of environmentally-friendly, safe products to use we are not going to be able to satisfy our customers as farmers."

It is definitely important that businesses like Corteva keep investing in their R&D to bring these products and allow us to then grow for the customers' requirements."

Mr Arnold is said he is passionate about ensuring the Australian industry flourishes on the world stage.

"We love farming. We love our product. We want to make sure we are growing the best fruit we can, and we always want to learn."

*This case study was developed by Corteva Agriscience.*

# Developing leadership skills for horticulture's future

Hort Innovation is committed to **cultivating and empowering future horticulture leaders at every career stage**. Active participation in programs such as the Nuffield Australia Farming Scholarships reflects our dedication to supporting rising talent, and the entire industry.



**Meet Stephanie Tabone**, horticultural researcher at Applied Horticultural Research and recipient of 2024 Nuffield Scholarship sponsored by Hort Innovation.

My first involvement with Hort Innovation was when I was accepted into the Growing Leaders Program, which was a leadership program to develop your leadership skills but also build your network within the horticulture industry. I gained a lot of useful skills and experience from being

part of that program, which began my leadership journey.

I work for Applied Horticultural Research, where we are currently delivering some levy-funded projects. I am working on the Soil Wealth and Integrated Crop Protection project, as well as the Potato Industry Communication and Extension project. I have recently been awarded a Nuffield Scholarship, also sponsored by Hort Innovation.

The Nuffield Scholarship involves a few compulsory elements that help to build your knowledge and network, such as a group overseas tour. The other important component is completing a research project, on a topic that

interests me personally but is also of benefit to industry. I have chosen to study the Effective use of legumes as an alternative nitrogen source in vegetable cropping systems.

The research that I do through my Nuffield Scholarship will benefit the broader horticulture industry by providing practical solutions that growers can apply on their farms to increase the amount of nitrogen that they obtain from a legume cover crop and then to synchronise the availability of nitrogen with the nitrogen demands of a succeeding vegetable crop.

The Scholarship will help me to develop my communication, research and networking skills, but will also expand

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my technical and agronomic skills on the ground.

When Nuffield Australia announced that I had won a 2024 Scholarship, I was very excited. It made me feel supported by the horticulture industry, and valued to be recognised as a future leader, particularly because the Scholarship is quite prestigious in the agriculture industry.

I am optimistic about the opportunities that lie ahead for my experience in the Nuffield program. I have enjoyed the process of choosing a topic and understanding what the challenges in the industry are, and am looking forward to connecting with people, identifying potential solutions, and then bringing those insights back to Australian growers.

In my opinion, an important part of the scholarship is collating the learnings you obtain through the program and your research, and communicating that information to industry in a way that is practical, clear and relevant to an Australian context.

I believe that leadership development is essential for the horticulture industry, first and foremost, to give emerging leaders the confidence to step up to take on further responsibilities and step outside their comfort zone.

Industry leadership development is also necessary from a succession point of view, making sure that we have people coming through the industry who not only have strong leadership skills but also the technical capability to support growers and the broader industry into the future. They need to be able to grow themselves and foster an environment that other people want to be part of, to encourage more people to pursue a career in the horticulture sector. It is a cycle that needs to be fostered.

The future of the horticulture industry is incredibly bright. There are so many different career opportunities that offer something for everyone, regardless of their skills, interests, or level of experience.

I have felt incredibly welcomed into the industry despite not being from a farming background, and it has made my career incredibly fulfilling so far.



“I am optimistic about the opportunities that lie ahead for my experience in the Nuffield program. I have enjoyed the process of choosing a topic and understanding what the challenges in the industry are, and am looking forward to connecting with people, identifying potential solutions, and then bringing those insights back to Australian growers.”

**Stephanie Tabone**

# Reducing your footprint for sustainable and economic outcomes

Red Rich Fruits is an Australian, family-owned grower, packer, marketer and shipper of superior quality fresh fruit. Established, owned and operated by the Napoleone family since 1948, Red Rich Fruits began as a grower of premium quality apples and pears – later expanding into stonefruit, citrus, berries and mangoes.



Hort Innovation spoke to **Joseph Napoleone** about Red Rich Fruits' commitment to sustainability.

## What sustainability initiatives has Red Rich Fruits implemented?

We have implemented a whole raft of individual initiatives that improve our sustainability. From installing moisture monitors on our trees and blocks so that we are not overwatering to hail netting our trees to protect them and reduce evaporation, transitioning to electric forklifts, building dams

and capturing runoff from our roofs, and more.

We are also very conscious of our food waste. For example, we now use 100 per cent of the apples we grow and have zero waste from that part of the business. Our first and second-grade apples go to fresh fruit sales, our third-grade fruit goes into the cider-making part of our business, and anything that is not good enough for our cider is made into a fertiliser we use on our farm. Something we also do in our winery with old grape product.

Red Rich Fruits is consciously reducing its environmental footprint for two reasons – to look after the environment and to improve the profitability of our

business. We have done many things out of practicality and necessity, but they have also contributed to our sustainability journey.

## Have you seen an increased focus on sustainability?

The focus on sustainability is ramping up now. We are seeing a big push from our corporate customers, particularly as new goals and targets emerge.

Some of our large customers have recently adopted the Science Based Targets Initiative (SBTI) Corporate Net-Zero Standard. So, as a supplier, we fall under their Scope 3 CO<sub>2</sub> emissions, which gives us an excellent opportunity to proactively evaluate our emissions and continue to be considered a preferred supplier.

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### What have your greatest sustainability challenges been?

Our greatest sustainability challenge is packaging and finding affordable alternatives to plastic. The biggest hurdle for us currently is that we use plastic packaging for our one-kilo fruit punnets, which are made of plastic that can not currently be curbside recycled, which creates a problem for consumers. We have reduced the thickness of the plastic but would love to find an affordable alternative.

### What is next for Red Rich Fruits?

The next step for us is to calculate exactly where we sit on our carbon footprint, figuring out our inputs and outputs to see where we currently sit and where we need to go.

We are also joining forces with Batlow Fruit Company which will unlock some exciting sustainability opportunities for us. For example, it will allow us to have farms and packhouses for apples in each of the eastern states, which gives us a unique opportunity to supply customers directly from each state. This change will minimise, or even eliminate,

inter-state transport, which has a significant cost and environmental footprint benefit. The benefit for us is two-fold – reducing costs while also reducing food miles.

### What is your advice to other growers thinking about sustainability?

My advice to anyone considering becoming more sustainable is ‘just to get started’. Everyone is at a different stage of their sustainability journey, and everyone’s businesses are different, but we are all in it together to help each other and share as much information as possible.

We talk to many people about sustainability and have benefitted greatly from learning from others’ experiences. For example, Red Rich Fruits also owns a winery, Punt Road Wines, and we just got certified by Sustainable Winegrowing Australia. Getting certified involved an audit process, which we passed with flying colours. We learnt heavily on another winery in regional Victoria that had previously undertaken that process – they are at the forefront of sustainability in winemaking, so we were fortunate to learn from their knowledge and resources.



“Our greatest sustainability challenge is packaging and finding affordable alternatives to plastic. We have reduced the thickness of the plastic but would love to find an affordable alternative.”

**Joseph Napoleone**

# Protecting pollinators from pesticides

Hort Innovation is partnering with researchers at The University of Sydney to develop environmentally-friendly pesticides that selectively target varroa mite.

Pollination is crucial to the long-term sustainability of Australia's \$16 billion horticulture industry. As we move from an eradication to management approach, measures to combat the pest have never been more critical.



Hort Innovation spoke to **Dr Emily Remnant** and **Prof Joel Mackay** from The University of Sydney who is developing a pesticide to control varroa mite without harming honeybees and the environment.

## **Q: What are the challenges of managing Varroa mite with pesticides?**

**Prof Joel Mackay:** One of the biggest challenges in handling the varroa mite is the close relationship between the mite and the honeybee. Even though bees and mites are different evolutionarily, they are still closely linked.

Finding molecules that can affect one but be safe for the other one is a real challenge. The fact that they are both locked up in a small box together

really makes it that much bigger a problem to deal with compared to other organisms interacting in an open environment.

## **Q: Tell us more about this pesticide.**

**Dr Emily Remnant:** We are designing a pest-specific molecule that targets varroa mite without having any effect on other organisms like honeybees, or any other beneficial insects in the environment. The objective is to target a hormone called the ecdysone receptor that is present among all insects, tick,

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“What I love about partnering with Hort Innovation is how we are connected with the growers, the producers and the industries who are potentially going to make the most use of the research that we carry out.”

**Prof Joel Mackay**



mites and spiders. By doing so we can exploit the differences in the way that this hormone acts between that of the varroa mite and the honeybee.

### **Q: How could this pesticide change the way we manage varroa mite?**

**Dr Emily Remnant:** The main way that our pesticide will change the way we manage varroa mite is we will not need to use chemicals in the hive that harm bees and the environment. By targeting a molecule specific to the pest, it means that our honeybees will not suffer any negative consequences.

It may mean that we can use this pesticide in more situations than we currently can. A number of pesticides that currently target mites can only be used when there is no honey in the hive. This is due to the damaging residues the pesticide can leave, harming the honey as well as the pollinators.

Using a pesticide that does not leave residues in honey or cause any damage to the bees will prevent these problems from occurring in the future and allow for more extensive use of such pesticides in the management of varroa mite.

### **Q: How will this research benefit Australian growers?**

**Dr Emily Remnant:** This research will benefit Australian growers by providing another alternative to broad spectrum pesticides that we commonly use on our pests.

It will eventually provide growers with an extra pesticide that they can use to target the varroa mite. This is critical at the moment due to the rapid spreading of varroa mite around Australia. There are a number of pesticides that we can currently use on varroa mite, however the mites are becoming more and more

resistant to these molecules. This new approach could revolutionise the way in which we deal with varroa mite on a global scale.

### **Q: What are the benefits of partnering with Hort Innovation?**

**Prof Joel Mackay:** Partnering with Hort Innovation is really an exciting opportunity. They have allowed our team to pursue a relatively early-stage project through the funding that they have provided. We have confidence in the success of the project, but to see that from a financial investment perspective is truly valuable.

What I love about partnering with Hort Innovation is how we are connected with the growers, the producers and the industries who are potentially going to make the most use of the research that we carry out.

# Holistic approach helping profitability of Manjimup enterprise

**An holistic approach to farming** has helped the Ryan family, of Manjimup, Western Australia, with their profitability.



Farmer Jake Ryan said the enterprise took a well-rounded view of farming and implemented a wide range of strategies looking at the big picture.

"We are all big on the idea of stacking enterprises," he said. "We run a four-year rotation, so one-year vegetables and three to four years as a pasture phase and soil building and then we go back to the veggies. It is all very diverse to help keep us profitable."

He said during the season, a vegetable crop is planted each week and after harvest, sheep will go in and graze the stubble.

The three-year period, post vegetable production could be a cereal crop, or mixed species perennial pastures with livestock grazing.

"We will seed it down to mixed perennial pasture species – up to 10 species – establish it for a year, then we will graze it and then the following two to three years," Mr Ryan said.

"We will seed annuals into it, so we will go from 10 species to 20 species aiming for that maximum diversity. The more variety, the more sheep will eat, and the more they eat, the more they gain."

"We are trying to stay diverse so that if a price of something drops, hopefully something else is up or is going to remain profitable. It leaves our business more open to flexibility, and less, I suppose, susceptible to different demands and supply chain issues."

The rotation has allowed them to increase the sheep on the property from 700 to 1000 and double the cattle numbers from 20 to 40.

"At the same time, we have got that mass diversity, we are really stimulating the biology in the soil to sequester carbon. It helps to compete with

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"We are trying to be as profitable as possible. We are also trying to farm as environmentally friendly as possible."

"This involves sequestering carbon, plant diversity, beneficial insects and getting the soil microbes working. We are trying to be profitable but do it in a way that is going to benefit the environment around us."

**Jake Ryan**



any diseases that will come in our cash crop.

"In terms of the brassicas, club root is one of our biggest diseases, and we have not had much of an issue with that. It has all been working quite well."

Soil tests are conducted in each paddock every three to four years and inputs provided using the William Albrecht method as a base.

"It is all about trying to get the five major cations in the right balance – calcium, magnesium, potassium, sodium and hydrogen," Mr Ryan said.

"We work out what the base saturation points are, and then adjust our fertility.

"We will work it out at the start of the year, apply it before we start doing the vegetable phase and then we will maintain that through the pasture phase as well to try to keep those soils in as good condition as possible."

The method has helped them increase organic carbon in a leased block, from six per cent to 10 per cent, in three to four years of cropping.

An Integrated Pest Management (IPM) program is also run across the enterprise which includes planting species to attract beneficial insects.

"We started mixing things like sunflower and buckwheat to our base fertiliser when we are transplanting," Mr Ryan said. "Sunflowers and buckwheat will pop up through the crops. We are trying to bring in our beneficial insects."

He said insects such as ladybugs, diadegma, and lacewings are used to help control Diamondback moth, aphids, and other pests that can be quite troublesome for their crops.

"At the same time, we are bringing more diversity so you are going to feed more biology in the soil."

They are also releasing diadegma species into the fields to provide a base of predators to keep pest numbers down.

"We go through, and we use soft chemistry, as soft as possible, but still strong enough to help keep that pest pressure down."

The enterprise also runs pasture raised chickens, with 2500 across the property sleeping in re-purposed caravans and supplying eggs.

"They go across the pastures spreading out manure and helping me to control bugs."

"We are trying to be as profitable as possible. We are also trying to farm as environmentally friendly as possible."

"This involves sequestering carbon, plant diversity, beneficial insects and getting the soil microbes working. We are trying to be profitable but do it in a way that is going to benefit the environment around us."

*This case study was developed by Corteva Agriscience.*



## Getting fruit and vegetables to those in need

**The ever-increasing need in our communities to provide food relief is a daily challenge for organisations such as Foodbank**, but a collaborative approach between growers and the organisation makes the process that much more easy, and timely.

Tayla Field is Foodbank Australia's national program manager for agriculture, and her role is to work with Foodbank's national produce donors to help deliver more fruit and vegetables to Foodbank via various structured supply and donation programs. Tayla also completed an internship at Hort Innovation in 2015.

Foodbank Australia coordinates procurement of in-demand produce for state members, manages the national

donor and national food programs, undertakes federal government advocacy and conducts research and analysis at a national level to help raise awareness. Tayla says that Foodbank is the 'pantry for the charity sector'.

At last count, Foodbank provided food and groceries to 2,625 registered charities and provided food for school breakfast programs to around 3,000 schools around the country, making it the largest food relief organisation in

Australia. In 2022, Foodbank sourced 45.6 million kilograms of product, equating to 82 million meals.

### **Meeting the demand and supply logistics**

As families feel the pinch, often the first thing that is taken out of the supermarket trolley is protein, followed by fruit and vegetables. As a consequence, demand for fresh produce for the fridge, or supplies to make value-add products such as pasta sauce is rising.

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“There is plenty of opportunity for fruit and vegetables that are surplus, out of-spec, or nearing the minimum acceptance date for the retailers. A lot of our donors support us directly from the farm. Our challenge is more around consistency of supply. For example, bananas are a staple part of the food for the school breakfast program, but if they are not available, our members need to find other options to fill that gap.”

**Tayla Field**



For growers that supply ALDI and Woolworths, an initiative advocated by Foodbank is via the HarvestMark system used by the supermarkets to accept – or reject – produce. In the event that produce is rejected, the grower can opt for the produce to be donated to Foodbank, rather than being collected or sent to landfill. Foodbank then collects the produce from the distribution centres alongside other produce that is to be donated. Foodbank has also received authorisation from the retailers for suppliers to donate packaged private label products to Foodbank, to avoid growers having to remove product from packaging and or send it to landfill.

A common scenario, said Tayla, is for collection directly from farm, to minimise the transit and handling of product from farm to families.

“There are a few different ways we can work with growers to pick up donated produce off-farm. The first is ad hoc donations, where a grower has surplus and or non-spec stock, that is still fit for us but they can’t find a buyer or home for it. We can usually find a home for it

and will work with the grower to find a simple solution for them.

“There are also seasonal opportunities, where a grower may have surplus supply of product or non-spec produce throughout the season that can be donated to Foodbank. In this instance, we can plan ahead on how to best use the resource and work out the logistics ahead of time.

“We can work with growers to have Hat bins and or CHEP bins available on farm at the start or throughout a season, so product can be loaded straight into bins allocated to Foodbank from the packing line or harvest. They can let us know a few days ahead of time when pick up is available and transport can be arranged.”

“One of the bigger challenges is actually around freight as it is one of the biggest costs for the donation process. If the grower has contracts in place with a transport company, it can be easier to piggyback on that. We do have partner freight companies that will do pro-bono pickups for Foodbank, and we also have some resources to pay for the freight.”

### **Get in touch and donate**

Tayla recognises that each grower has a unique set of circumstances to overcome to become a donor directly from-farm but sees that increasing demand by families will require extra resources.

“I want to make the process of donation as simple and rewarding as possible for the grower,” she said.

“I encourage growers to get in touch with me or their State Foodbanks, to start the conversation, about how much they feel comfortable with donating, whether it is a seasonal surplus or something more long term.

“We can have a chat about how often it is picked up, what we can do about transport costs, or alternatively establishing a collaborative partnership for processed goods. Let’s work together to create a calendar for our members and agencies that shows what produce is coming in and when.”

*This case study was developed by AUSVEG.*

# Educating health professionals on the nutritional benefits of avocados

Each year, Australia's horticultural producers grow six million tonnes of fruits, vegetables and nuts to nourish people around Australia and the world. The 2024 Australian-grown Horticulture Sustainability Framework aims to develop 'healthier, nourishing diets through increased consumption of readily available, affordable Australian-grown fruits, vegetables and nuts.'



To encourage the healthy consumption of horticultural produce, Hort Innovation invests in research about the nutritional benefits of horticultural produce and programs designed to convey that information to healthcare professionals such as dietitians.

## Efforts underway in the avocado industry

The avocado industry runs a project that delivers evidence-based information about Australian avocados to healthcare and food service professionals across Australia. By improving the awareness, knowledge and attitude of health professionals to the nutrition and health benefits of

avocado, they will be encouraged to recommend avocado to their clients, or include avocado in their menus, and ultimately help drive Australian avocado purchase and consumption.

The project team is responsible for a range of activities, including:

- Establishing a digital hub that houses nutritional resources on avocados such as recipes, meal plans and local and international research on the health benefits of avocados.
- Conducting a systematic literature review on avocados and health outcomes. This research has underpinned all other project activities.
- Communicating with health professionals via a range of channels such as roundtable discussions, media releases, social media toolkits, a regular e-newsletter and participating at industry conferences. The project team is also working collaboratively with relevant professional associations and health influencers.
- Running farm tours to connect health professionals with avocado growers and showcasing key growing regions and varieties to demonstrate the breadth of the avocado industry.

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## Hear from the project team and participants

"Educating health professionals on the nutrition and health benefits of Australian avocados has been a valuable three-year program, delivering evidence-based information to dietitians, general practitioners, and fitness professionals. **The program has improved the awareness, knowledge and attitude of health professionals**, encouraging them to recommend avocados to their clients and ultimately help to drive avocado purchase and consumption."

**Penny Eustace, APD, Bite Communications project manager**

"The avocado health professional program helped to raise awareness of the many nutrition and health benefits of avocados, as well as their culinary versatility. Importantly, it also helped to reassure health professionals that avocados are great for weight management and also useful for people wanting to manage their blood glucose levels. **It's a welcome message that something so delicious to eat is also nutrient-dense and has a range of health benefits for all ages.**"

**Nicole Senior, APD, project sub-contractor**

"I had the honour of attending the Australian Avocados Farm Tour at Donovan Farms in Central Queensland earlier this year. **As a Dietitian and nutrition content creator, I found it extremely beneficial to see the farm-to-table process first hand from Australian avocado growers** and receive the latest avocado health and nutrition information. It was a thoroughly enjoyable experience and one that has encouraged me to recommend Australian avocados and their health benefits even more!"

**Rebecca Gawthorne – Dietitian & Nutritionist**



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