impact update

Hort Innovation

Welcome to the third edition of Hort Innovation's new publication, **Impact Update** – a snapshot of your investments in action and how they are making an impact on the ground.

In this edition...

R&D: Grower finds mapping tool invaluable to his business

The investment *Multi-scale monitoring tools for managing Australian tree crops* is a collaborative piece of work funded through the Australian Government's Rural R&D for Profit initiative. The overarching program is continuing to develop, trial and extend technology-based crop mapping and monitoring tools to help growers predict fruit quality and yield, and monitor tree health – including in the early detection of pest and disease outbreaks.

This project involves some nine sub-projects sitting under an overarching project, with a variety of teams all being led by Hort Innovation.

MEET RAYMOND, MANGO GROWER FROM DIMBULAH, NORTH QUEENSLAND

Raymond Courtice is a second-generation mango grower from Dimbulah, north Queensland who works at his family business, Ontario Group, with his father David. Ontario Group is a family-run business, revolving around the production of calypso mangoes as well as citrus to diversify and utilise their staff and equipment throughout the year. David was one of the first commercial growers of calypso mangoes in the late 1990s and they have stuck with the variety ever since. The Ontario mango orchards are spread across two locations of 400ha.

Why did you participate in this program?

When Kerry Walsh from Central Queensland University told me he was working on creating a unit that would count your crop load and give you an accurate result of every location within your farm, my ears pricked.

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Mango grower, Ray Courtice

Standard practice is manual fruit counts averaging across the block to give you your expected crop load for the season.

During the 2019/20 season, we experienced frost with temperatures dipping to minus five degrees, damaging 70 per cent of our crop.

At this point we had frost protection fans installed within the orchard which usually gave 100 per cent protection for short stints between 0 to -3 degrees, but at -5 degrees this was not the case.

So, when the opportunity was presented to trial crop forecasting using the machine vision rig on my orchard, I was 100 per cent in for using technology to give me accurate data on how much damage the frost had done to my crop load.

Accurate crop forecasting data is invaluable for planning for harvest and marketing.

How does the technology work?

The machine vision rig, which is linked to GPS, is mounted on a vehicle and the whole orchard can be 'photographed'. We have found that every three rows is the intensity vs accuracy 'sweet spot'.

Data is calibrated with manual fruit counts – a similar requirement to previous yield forecasting, and then the location and imagery data is processed to generate a 'heat map' of yield across the orchard.

What did you learn?

What this technology offers over other yield estimation tools and forecasting strategies, is a picture of spatial variability in yield across the orchard. We could clearly see where our frost protection could not reach or protect and there was no fruit, ranging to close to the frost fans where the loss was only about 25 per cent.

While my initial interest in trialling the equipment was to understand the scale of the frost damage, the experience showed me that the technology could provide useful data that was impossible to get with manual forecasting practices.

For example, you can make the wrong calls on fruit profile – and then your water and nutrition management can result in fruit ballooning. The production forecast maps generated using this equipment, gives information not otherwise available to manage the orchard to optimise production.

What this now allowed me to see and understand was instead of treating whole zones in the orchard, I was able to tailor nutrition and irrigation to target certain blocks for domestic and export markets as I had a full understanding of predicted yield, size, profile and entire orchard expected fruit count.

What has been the benefit?

The immediate benefit of using this technology is that we can now tailor our management practices to ensure we have 'got it right' for the fruit that survived the frost and minimise further losses due to fruit quality. It also gave us information that enabled us to increase the number of frost protection fans we needed to have for full coverage of the orchard.

Using the imaging rig is now an operation that I have adopted post-fruit drop and pre-harvest to monitor and manage crop load, nutrition and water, and pre-forecast for our marketers, exporter, freight, carton and labour companies. It gives me assurance that what I believe we are looking at harvesting is actually on the farm. Being able to have this sort of tool becomes an advantage in this era of farming. Participating in this project has given us a tool we now couldn't see our operation work without.

R&D: Updating nutritional data for horticultural commodities

Food composition data is a valuable tool that can be used to encourage more Australians to purchase and consume fruit, nuts and vegetables.

Delivered by Curtin University, the project *Nutritional analysis of across horticultural commodities* (ST19036) updated the national food composition data for edible Australian-grown horticultural commodities by using current analytical methods to measure the nutrient content of plant food samples that represent the current growing conditions in Australia.

The research delivered profiles for 150 nutrients across more than 90 Australian-grown fruit, vegetable and nut commodities and, for relevant nutrients, the percentage of the Recommended Dietary Intake of certain nutrients available from one serving of food.

Why is this research needed?

Plant foods are naturally nutrient-dense, a valuable attribute that marketing can highlight. To enable the marketing and promotion of food products, accurate food composition data is needed to identify key nutrients.

Australia has lacked up-to-date food composition data for many horticultural commodities. The majority of data reported in the Australian Food Composition Database for many fresh fruits and vegetables were generated more than 30 years ago.

Nutrient content may vary by geographical or climatic conditions, production method and variety within commodities, which may change over time.

The methods used to measure many nutrients have also improved over time, allowing more accurate reporting across a greater range of nutrients.

Investment by the horticultural industry was crucial for generating current and representative food composition data for a broader range of horticultural commodities. Resources to support analytical programs to update food composition data are extremely limited outside the industry.

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What did the research aim to do?

The project had three key objectives:

1. To develop a sampling plan in liaison with Food Standards Australia New Zealand for updating the national food composition data for edible horticultural commodities in Australia.
2. To produce accurate, reliable and representative food composition data for edible horticultural commodities in Australia for inclusion in the Australian Food Composition Database.
3. To calculate the percentage of the daily intake for nutrients and energy obtained from consuming one serving of the food.

Nutrient data gaps and data that needed updating were identified in collaboration with Food Standards Australia New Zealand and the Australian Food Composition Database manager.

A sampling plan was developed to purchase commodities at the peak of their season. To capture the natural geographical variation in nutrient composition, 6-19 purchases per commodity were made across three cities (Sydney, Melbourne and Perth), resulting in 932 purchases. These food samples were analysed for relevant nutrients, including proximates, organic acids, vitamins, minerals, fatty acids and antioxidants at the National Measurement Institute of Australia.

Who will this research benefit?

This research will benefit a wide range of stakeholders, including:

1. Growers and other industry stakeholders: to identify, label and promote commodities as good sources of key nutrients.
2. Consumers: to identify and select good food sources of key nutrients.
3. Health educators and professionals: to recommend horticultural produce based on nutrient content and to develop appropriate public health nutrition messages.
4. Researchers and health professionals: to estimate and optimise intakes of nutrients from plant foods.
5. Food regulatory bodies: to monitor relevant nutrients in the food supply.

Where will the information be made available?

The new food composition data will be freely available through future releases of the Australian Food Composition Database.

The project has also provided nutrient composition data updates to other Hort Innovation-funded projects conducting scientific literature reviews for specific industry sectors, namely, the citrus, sweet potato, avocado, nut, mushroom, melon and onion industries.

SOME FUN FACTS FROM THE RESEARCH

- Capsicum contains more vitamin C than oranges
- Green peas are a good source of folate
- One serve (75 g) of carrots provides more than your daily vitamin A requirement.

International Trade: Realising the table grape industry's export ambitions

From 2017 to 2020, the investment *Table grape export readiness and market access* (TG17000) continued industry work into market access and development. Delivered by the Australian Table Grape Association (ATGA), the project provided a point of contact for growers, exporters and others looking for expert industry advice in relation to the export of Australian table grapes. Disseminating relevant information, including season updates and data on shipping and market conditions were also priorities.

Project activities ensured that a cohesive approach was taken by the table grape industry towards export and market access. During the timeframe of the project, the table grape industry experienced a 43 per cent increase in export volume, 65 per cent increase in export value and a 67 per cent increase in unit price.

In 2022, a Hort Innovation impact assessment found that the project had a 17.1 to 1 benefit-cost-ratio and identified a number of benefits, including:

- Sustainably increased production due to increased export demand and improved market access for producers
- Maintenance of existing export markets via relationship management
- Grower cost savings in the facility export registration process, attributable to the roll out of ATGA registration software
- Increased capacity and understanding of export markets and trade negotiation
- Increased contribution to regional community socioeconomic wellbeing from an expanding table grape industry.

MEET PHILLIP BRANCATISANO, EXPORT SALES MANAGER AT THE GRAPE HOUSE GROUP

"My role as Export Sales Manager had me focused on growing our export book, and as an individual grower this can be challenging. Through this project, the Australian Table Grape Association (ATGA) was able to build the profile of Australian table grapes overseas and successfully increased demand for our produce, allowing businesses like ours to grow our exports.

Through the project, I had the opportunity to attend trade missions to several countries including South Korea, Vietnam, Japan and the Philippines. We met with stakeholders involved in the importation of Australian table grapes and attended trade fairs such as Asia Fruit Logistica.

With the general increase in demand for Australian table grapes resulting from the project, and the contacts I had made for buyers, over the project period our export business doubled from approximately 500,000 boxes of grapes to about one million. As a business we have taken advantage of the price premium by shifting our produce from domestic to export markets.

Even if we had not been involved directly in the project, our business would have benefited from the increased demand for Australian table grapes. However, I think that being involved has sped up (and potentially increased) the benefits. This increased knowledge of export markets and protocols, combined with the exposure to new customers has been invaluable.

I openly tell other table grape growers how helpful it was to be involved in this project. For me, it really highlighted how important it is to get to know your customer."

Visit ***hortinn.com/tg17000*** for more details on the project and to access the final report. The table grape industry's levy-funded export efforts have been continued through the Hort Innovation investment *Table grapes market access and trade development* (TG20000), also delivered by the ATGA.

Marketing: Enhanced shopping experience for apple and pear customers

In 2022, the apple and pear industry worked with retailers to deliver a better shopping experience for customers when buying Australian apples and pears. The levy-funded investment *Apples and pears quality assurance program* (AP21002) educated retail staff on best practice merchandising principles to improve the appearance and quality of produce in-store.

Delivered by Strikeforce, there were two components to the program:

1. In-store quality assessments of the apple and pear displays, including an evaluation against best practice merchandising principles to help improve the quality of displays and produce.
2. Store staff education on the importance of well-merchandised product in line with best-practice guidelines to assist and grow sales outcomes.

How did the program run?

The program ran from April to July this year, with 700 stores across Coles and Woolworths receiving weekly visits from a team of dedicated merchandising representatives. The program's primary goal was to see whether improved displays encouraged consumers to increase the frequency and weight of their purchases.

The merchandising personnel visited 400 Woolworths and 300 Coles stores for 18 weekly visits, each taking around 40 minutes. Fifty-eight per cent of the visits were in the morning, and 42 per cent were in the afternoon/evening to allow for a cross-section of results. The merchandising team conducted the bi-weekly call.

The products reviewed on each call were:

- Apples – Envy, Granny Smith, Jazz, Kanzi, Pink Lady, and Royal Gala
- Pears – Beurre Bosc, Packham, William Bartlett and Corella.

Data was captured and inputted to an online dashboard, and photos from every store were uploaded to a gallery. The merchandising team educated store staff via training videos, and tip sheets were distributed and held in every store.

Regular updates from Coles and Woolworths were positive throughout the project, with household penetration reported to have improved by two per cent since the program's inception.

The Hort Innovation Customer Marketing Team had regular meetings with Woolworths and Coles across the season to discuss any ongoing availability and presentation opportunities.

The results

The program was highly successful, with the data showing an improvement in sales across merchandised stores versus not merchandised stores of up to 3:1. Woolworths and Coles both saw strong results across the presentation, availability and quality performance measures, with several areas identified for improvement. Over 1500 store produce staff were trained on correct merchandising principles.

Ninety-seven per cent of stores now have the quality of display rated as either Good or Fair, up from 78 per cent at the commencement of the program. Eighty-four per cent of stores have a full/or three-quarters full display, up from 61 per cent, and 86 per cent of stores now have no product presentation issues, up from 52 per cent.

Product with defects has steadily reduced throughout the program, and a gradual upward trend was seen in product availability. The results showed a steady improvement in the reduction of defects and the availability of products, meaning the training and the weekly merchandising visits helped change in-store behaviour and lift display standards.

> "Appealing point-of-purchase displays that entice consumers to the category are at the foundation of any consumer investment.
>
> "If the point of purchase experience is a poor one, any marketing investment beyond this is somewhat redundant. Having well-executed in-store retail merchandising is a powerful tool to build trust in the category."
>
> **Phil Turnbull, CEO of APAL**

Data & Insights: Fostering the future with data-driven decisions

Hort Innovation invests in a range of programs to provide growers with the information they need to make effective business decisions.

Hort Innovation's Industry Analysis portfolio of work is vital to Australian horticulture as it assists industry and growers to make informed, data-driven decisions by reporting on key data and insights obtained through the various supply focused data initiatives.

SNAPSHOT OF THE INDUSTRY ANALYSIS PORTFOLIO

22
projects

11
projects across sixindustries (macadamia, almond, turf, papaya, nursery and avocado)

12
Multi-industry projects

$8.1M
spent across the entire portfolio in 2021/22

$4.6M
spent on 8 projects in 2021/22.
These projects are supply-oriented and relate to collecting and disseminating industry data.

"The industry analysis portfolio is constantly evolving to deliver added benefits to growers. Each project is about enabling industry to make informed decisions through access to relevant data. I believe an inevitable and exciting development will be the inclusion of sustainability monitoring in the future."

Lucy Noble, Industry Analyst for Hort Innovation's Data & Insights Team who manages this body of work.

PROJECTS IN THE INDUSTRY ANALYSIS PORTFOLIO

- *Australian Horticulture Statistics Handbook 2021-22 to 2023-24* (MT21006). See more at *hortinn.com/mt21006*.
- *Horticulture trade data* (MT19005). See more at *hortinn.com/mt19005*.
- *Macadamia industry benchmarking and industry sustainability insights 2022-2027* (MC22000). See more at *hortinn.com/mc22000*.
- *Macadamia crop forecasting 2023-2025* (MC22001). See more at hortinn.com/mc22001.
- *Australian almond industry statistics and data collection 2020-2022* (AL19005). See more at *hortinn.com/al19005*.
- *Avocado industry and market data capture and analysis* (AV20000). See more at *hortinn.com/av20000*.
- *Papaya market supply data capture and analysis* (PP20003). See more at *hortinn.com/pp20003*
- *Turf industry statistics 2020-21 to 2024-25* (TU21000). See more at *hortinn.com/tu21000*.
- *Nursery industry statistics 2020-21 to 2024-25* (NY21000). See more at *hortinn.com/ny21000*.

A closer look at the macadamia industry

The macadamia industry has recently begun collecting data as part of *Macadamia Industry benchmarking and industry sustainability insights 2022-2027* (MC22000), following on from project *Benchmarking the macadamia industry 2019-2021* (MC18002). By providing Australian macadamia growers with the opportunity to benchmark their production against a range of farm performance metrics, this project aims to establish a financially viable and competitive macadamia industry through the identification and widespread adoption of best practice.

Macadamia grower, Bruce Macquire

> "Benchmarking has allowed me to track my kernel quality and highlighted the issue that mine wasn't particularly good. It really gives you something to aspire to, and while we were thinking we are going well here, it shows we could do better."

Through this program and earlier benchmarking investments in the macadamia industry, growers receive free and confidential benchmark reports which provide a seasonal assessment of their farm performance. This helps individual businesses understand drivers of best practice, gain a better understanding of seasonal outcomes and aids in positioning themselves within the wider industry context.

In June 2022, a survey of MC18002 participants found that 88 per cent of respondents used their farm benchmark report to better understand how their farm compared with others and 83 per cent used their benchmark report to monitor and track farm performance.

Bruce Macquire, a macadamia grower from Kin Kin, Queensland, purchased his farm in the early 1990s and has participated in the benchmarking program since 2014. Through the benchmark report, Bruce learnt that his input costs over the last three seasons were higher than his historical average, however the average cost per tonne remained lower than the benchmark group average. Bruce said the benchmark report was useful for his business, as it clearly demonstrated where areas of improvement to his orchards were needed.

"Benchmarking has allowed me to track my kernel quality and highlighted the issue that mine wasn't particularly good. It really gives you something to aspire to, and while we were thinking we are going well here, it shows we could do better."

Macadamia Industry benchmarking and industry sustainability insights 2022-2027 (MC22000) has expanded its focus from productivity and quality reporting, to establish measures of macadamia farm and industry sustainability. The project supports the delivery of Outcome 4, Strategy 3 of the Macadamia Strategic Investment Plan 2022-2026, that aims to 'use industry production benchmarking activity to measure and track industry productivity and profitability and sustainability metrics'.

Aligning with ***Hort Innovation's Australian-grown Horticulture Sustainability Framework***, several potential sustainability indicators have been identified for this benchmarking project:

- Energy efficiency
- Soil health
- Carbon sequestration
- Water-use efficiency.

Once collected, this data will be used to help the Australian macadamia industry demonstrate its sustainability credentials, with the knowledge that this is a growing area of interest for consumers.

PROJECT SPOTLIGHT

Australian Horticulture Statistics Handbook (MT21006)

- The most comprehensive and contemporary data available on all sectors of the Australian horticulture industry, in one easy-to-use guide.
- Collates accurate and robust industry data to underpin evidence-based decision making across a broad stakeholder base, establishing key industry metrics that validate industry growth trends and patterns.
- Features information drawn from several supply chain sources, including international trade statistics and peak bodies.
- Provides data on more than 70 horticultural products, including fruits, nuts, vegetables, turf and cut flowers.
- The 2021/22 handbook will have new additions and enhancements, presenting production (volume and value) in conventional production and protected cropping systems, plus extending the level of production detail to state level.

Extension: Banana extension program provides a 'short-cut' to the best way to do things

A national extension program is equipping the banana industry with the information and networking opportunities needed to improve their management practices.

The investment *National banana development and extension program* (BA19004) is tasked with helping deliver the outcomes of levy-funded and other R&D back to the banana industry, to help growers access and implement new information, technologies and approaches, and make better decisions for their businesses.

This project has two components working closely together to form a national program: a tropical component specific to the Queensland banana industry, and a subtropical one for New South Wales and Western Australian production regions. It is delivered by the Department of Agriculture and Fisheries, Queensland (for the tropical component) and the NSW Department of Primary Industries (for the subtropical component).

The program's activities involve industry development officers who deliver...

- The Better Bananas website, *betterbananas.com.au*
- National banana roadshow events, held biennially
- Field walks and industry workshops
- Industry meetings and tours, including NextGen young banana grower group activities
- Grower training activities
- Resources, including fact sheets, videos and articles for *Australian Bananas* magazine
- Direct engagement with growers and others in the banana supply chain
- Innovative field trials and other research activities.

MEET ANDREW SERRA, BANANA GROWER FROM TOLGA IN FAR NORTH QUEENSLAND

Andrew Serra is a third-generation grower working at his family business, Serra Farming, with his wife, three children, parents, and four brothers. They have three farms totalling 200 hectares near Tolga in Far North Queensland. Serra Farming has been growing Cavendish bananas for 10 years and Hass and Shepard avocados for eight years.

Why do you participate in the extension program?

"I've participated in as many extension events on offer as I can. I believe you only get out what you put in. Sharing knowledge and experience formally or informally at extension events helps build your network. If you give, others see this, and it builds trust and information is shared back. Networking and learning from others are critical. It can be a shortcut to the best way to do things, saving a longer journey and giving a better outcome."

What have you learned?

"That you only get out what you put in; you always take something useful away from an event and networking. It can be hard to make the time to participate in industry activities, but you always get back more than the few hours you put in.

Participating in the NextGen activities has provided the opportunity to get to know the next generation of forward-thinking growers in the industry. The banana industry roadshows are a great way for our business to keep abreast with the current research and development and get a competitive advantage. The biosecurity field events, information and resources made available to our industry through this program, enable us to make informed decisions about what will work best for our business by incorporating others' knowledge and experiences".

Banana grower, Andrew Serra

What is the benefit of being involved with the project?

"About 90-95 per cent of our farm practices have been adopted based on what we have learnt from other farmers. This includes crop management practices, shed set-up and operations and biosecurity management. There are heaps of different ways to any given aspect of farm management. Sometimes you do not need to try things for yourself because you can learn from others' experiences and what they have successfully implemented. Hopefully my involvement in extension activities can give similar benefits to others."

Download your industry's Hort Innovation Fund Annual Report

See how your industry's levy was invested in 2021/22 in your industry-specific Fund Annual Report. Each report provides a closer look at key project information from the year, including grower case studies that dive deeper into levy investments that have made an impact on the ground. Visit *www.horticulture.com.au/annual-report-portal*.

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Visit **www.horticulture.com.au** for more about Hort Innovation and our work on your behalf, including details of all our investments.

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