Impact Update

Hort Innovation

Welcome to **Impact Update** – a snapshot of your Hort Innovation investments in action and how they are creating lasting change.

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In this edition...

Working together to combat fall armyworm

Fall armyworm was first detected in Australia in the Torres Strait in January 2020 and has since spread to every State and Territory except South Australia. The ravenous pest is known to feed on more than 350 different plant species and can travel up to 400km a night – making it challenging to curb its geographical spread. The pest destroys vegetable crops, reducing yield and profitability for growers.

When fall armyworm first arrived in 2020, Hort Innovation leveraged our strong, collaborative relationships with other plant-based industries to support growers who were impacted. Industry's cooperative approach to fall armyworm has continued over the past few years as the focus turns to long-term research, development and extension (RD&E) for managing the pest.

Since the incursion, Hort Innovation has invested more than $13 million in a host of initiatives to combat the pest, such as identifying potential predators, researching pheromones to aid in the

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development of baits for monitoring and trapping, developing a molecular test for identification and a podcast series with international experts.

We are working to strengthen industry readiness for existing and emerging threats through investments that support the development of on-farm biosecurity plans and pathways to business recovery in the event of biosecurity incursions. Projects like the Vegetable industry biosecurity and business continuity strategy are leading the way for preparedness, response, and recovery.

Hort Innovation chief executive officer Brett Fifield said that it is crucial to get growers on the front foot when it comes to monitoring for and managing fall armyworm.

"Fall armyworm is here to stay, so we are collaborating with industry, researchers and government to equip growers with what they need to reduce the pest's impact while remaining productive and profitable," Mr Fifield said.

"This portfolio of investments will accelerate our response towards the pest by rapidly bringing cutting edge science into growers' management tool kits, developing best practice guidelines for growers and ensuring these are communicated widely."

"Fall armyworm is here to stay, so we are collaborating with industry, researchers and government to equip growers with what they need to reduce the pest's impact while remaining productive and profitable."

Brett Fifield,
Hort Innovation chief executive office

Looking for more information on fall armyworm?

Head to the Fall Armyworm eHub at *daf.engagementhub.com.au/fallarmyworm* to engage with the latest fall armyworm (FAW) RD&E activities for horticulture:

- **Read** the latest news updates on FAW management, moth activities and seasonal patterns, and insecticide resistance results
- **Access** FAW RD&E resources
- **Engage** in discussion, report on FAW activities, ask a question and provide feedback
- **Find** FAW-related event information

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Let's take a look at how Hort Innovation is partnering with industry, researchers, and government agencies to equip industry to combat the pest

National fall armyworm innovation system for the Australian vegetable industry (VG22006) delivers a nationally coordinated program to reduce fall armyworms' impact on the vegetable industry by arming growers with tools and knowledge. Delivered by the Department of Agriculture and Fisheries Queensland, the program brings research and experience insights into fall armyworm management from across the globe into on-farm demonstration sites within Australian vegetable growing regions.

The industry demonstration and engagement activities are underpinned by world-class research to ensure the vegetable industry is getting the most up to date information available.

Find out more at *hortinn.com/vg22006*.

Effective fall armyworm pheromone blends for improved monitoring and population estimation in Australia (AS21000) is investigating the geographical variation of the sex pheromone in fall armyworm populations in Australia. Delivered by Macquarie University, this information will assist in optimising pheromone blends in lures for monitoring and mass trapping and application in mating disruption.

Find out more at *hortinn.com/as21000*.

Management options for reducing the reliance on insecticides for fall armyworm in sweetcorn (VG23006) is providing vegetable growers with reliable crop monitoring methods and a broad suite of tactics to reduce frequency of insecticide applications and ensure ongoing viability sweet corn and capsicum production in high-risk fall armyworm regions.

Delivered by the Department of Agriculture and Fisheries Queensland, the project will deliver a range of outputs to improve growers' understanding of non-chemical management options for fall armyworm and their practical implementation.

Find out more at *hortinn.com/vg23006.*

Vegetable industry biosecurity and business continuity strategy (VG22004) is developing a biosecurity strategy for the vegetable industry, providing an adaptable, flexible approach to preparing for, and responding to the arrival of high-priority exotic pests and assisting with the initial monitoring and management of pests that are still establishing.

Delivered by AUSVEG, this project is equipping growers with tools to detect and respond to pest threats effectively, ensuring a resilient industry. With collaboration from key partners, including Plant Health Australia and state biosecurity agencies, the program focuses on surveillance, data-driven decision-making, and business resilience.

Find out more at *hortinn.com/vg22004*.

Identifying potential parasitoids of the fall armyworm, Spodoptera frugiperda, and the risk to Australian horticulture (MT19015) examined potential parasitoids of fall armyworm and delivered extension materials to growers on how to effectively manage the pest.

Delivered by the Department of Agriculture and Fisheries Queensland, the research team identified parasitoid species present in horticultural crops and provided recommendations on potential candidates for future biological control of fall armyworm. They also provided local information on established locations, host range, infestation levels on horticultural crops and damage patterns.

Find out more at *hortinn.com/mt19015.*

Field-based testing for fall armyworm (MT19014) developed a rapid molecular test for use in the field for early detection and identification of fall armyworm (FAW).

Delivered by the Victorian Department of Jobs, Precincts and Regions, the project:

- ·Facilitated the rapid identification of fall armyworm in regional Australia through in-field testing across multiple horticultural areas.
- Increased awareness of in-field testing in regional Australia, especially northern Australia. This included engaging with biosecurity and growers to demonstrate the testing.
- Improved knowledge of technological requirements in regional Australia to allow the rollout of this technology for fall armyworm detection and surveillance.

Find out more at *hortinn.com/mt19014.*

Co-developing and extending integrated fall armyworm management systems for the Australian vegetable industry (VG20003) supported the vegetable industry in managing fall armyworm by developing a strategy for affected regions and regions that may experience an incursion in the future.

Delivered by the Department of Agriculture and Fisheries Queensland, the program improved the vegetable industry's understanding of fall armyworm biology and seasonal patterns, minimised the use of ineffective chemistries and provided information on new generation chemistries, improved understanding of endemic natural enemies of fall armyworm and increased knowledge of the insecticide resistance levels of fall armyworm.

The project team used a collaborative approach to bring together knowledge and experience in managing fall armyworm across industries. It developed a communications and extension strategy to increase fall armyworm knowledge and deliver the latest information to industry.

Find out more at *hortinn.com/vg20003*.

PIPS supporting growers on the path to profitability

Just as many apple and pear family farming operations in Australia are multi-generational, one particular research and development program to support those growers has also spanned the decades.

The Productivity, Irrigation, Pests and Soils (PIPS) program began in 2009 and continues to deliver whole-of-orchard system research, development and demonstration to drive Australian apple and pear production.

Now in its fourth iteration (known as PIPS 4 Profit), the program continues to equip growers with essential information and support to inform their decision making, productivity and sustainability.

PIPS 4 Profit is a five-year program aimed at accelerating the commercial implementation of best management practices that have the greatest potential for apple and pear growers to reap economic benefits while remaining sustainable.

Funded by Hort Innovation using the apple and pear research and development levy and funds from the Australian Government, the program is a collaborative effort led by the Tasmanian Institute of Agriculture (TIA) and Agriculture Victoria, in partnership with the Department Primary Industries and Rural Development (Western Australia), New South Wales Department of Primary Industries, Pomewest, Lenswood Apples, and Apple and Pear Australia Ltd (APAL).

Over the years, the PIPS programs have built a wealth of knowledge about management systems, soils, nutrients, water use, integrated pest and disease management, and technology.

Through the current five-year PIPS 4 Profit program, economic and business case studies will demonstrate how research and development findings may support growers to improve their profit and sustainability.

The program features an extensive network of farm trials and demonstration sites on growers' properties.

Participating apple and pear grower Scott Price from Tasmania said the program had already shown value and he was excited about future possibilities.

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"I am pleased to see the latest PIPS program is focusing on implementing research on farm to improve our bottom line and ensure our businesses are viable long-term," Mr Price said.

The key PIPS 4 Profit program areas of activity are:

- Optimising apple and pear production systems by investigating profitable orchard renovation, crop load management, spatial and temporal management and climate readiness strategies that maximise quality and increase input efficiencies, particularly labour and water.
- Using Integrated pest and disease management (IPDM) by combining knowledge on entomology, plant pathology, genetics, ecology, technology, and risk management, underpinned by a community of practice extension model.
- Building sustainable soils by developing new knowledge linking orchard floor managements with soil health and evaluating the economic impact of potential changed managements to overall orchard profitability.
- Preparation of evidence-based case studies that demonstrate how indicators of environmental sustainability and economic benefit can be informed by research, industry and orchard generated data. These show how orchard businesses are undertaking, or can potentially improve, practices that deliver increased resilience, efficiency, profitability and a stewardship approach to managing natural assets and people.

An extensive suite of PIPS 4 Profit resources, including grower case study videos, are available via the Apples and Pear Australia Ltd (APAL) website at ***PIPS 4 Profit Resources | Apple and Pear Australia Limited (APAL).***

Growers cotton on to soiled undies

The PIPS3 program which ran from 2020-2023 will long be remembered for one of its novel campaigns, in particular, which attracted widespread attention and grower engagement.

Through the 'Improved Australian apple and pear orchards soil health and plant nutrition' project led by the Tasmanian Institute of Agriculture (TIA) and Pomewest, a 'Soil Your Undies' campaign encouraged growers to check the state of their soils in a most unusual way.

Growers buried cotton underwear for eight weeks and then dug them up to check how degraded they were – high soil microbial levels resulted in highly underwear.

The project was effective in stimulating growers to better understand their soil health and sparking an opportunity to improve it.

Good soil biology encourages recycling of organic matter, making nutrients more available to plants. It also supports soil structure and is fundamental to environmentally sound and efficient production systems.

Growers who participated in the Soil Your Undies challenge could submit their results to a website which included a map where growers could compare their soiled undies with others.

Showing off their soiled undies are TIA's Dr Sally Bound (left), Freddie Fahey, Matt Tack, Matt Griggs, Brett Squibb and Scott Price. Photo Sophie Folder

"I am pleased to see the latest PIPS program is focusing on implementing research on farm to improve our bottom line and ensure our businesses are viable long-term,"

Scott Price, Tasmanian apple and pear grower

India bowled over by Australian avocados

This article was developed in collaboration with Avocados Australia

Did you know that if just **one per cent** of the Indian population purchased an Australian avocado each year, there would be demand for **15 million additional avocados** annually?

This month, the official entry of avocados into the Indian market was announced at Avocados Australia's Launch Trade Reception held at the Australian High Commission in New Delhi in India.

This exciting collaboration marks a significant milestone for both Australian avocados and the Indian fresh fruit market. Reputed for their superior quality and health benefits, Australian avocados are set to give Indian taste buds an amalgamation of flavour, texture and nutrition. With Brett Lee as a brand ambassador, this launch aims to introduce a premium and healthy option to Indian households, promoting the incorporation of avocados into everyday meals and snacks.

The avocado market in India is gaining momentum. Avocado consumption has increased in India, with global demand also witnessing a significant surge over the past decade. Avocado is a healthy addition to all diets and is particularly perfect for those eating vegetarian diets.

The Australian avocado industry is growing rapidly, Australia produced just over 115,385 tonnes of avocados in 2022/23 and production is forecast to increase strongly over the next few years to approximately 170,000 tonnes by 2026. In line with this production growth, Aussie growers are committed to developing new overseas markets such as India. Increased exports will be critical for the future viability of the Australian avocado industry.

Avocados Australian chief executive officer John Tyas said industry is excited to bring the exceptional taste and nutritional benefits of Australian Hass avocados to India.

"We are excited to bring the exceptional taste and nutritional benefits of Australian Hass avocados 10 months a year to the diverse Indian market. With our focus on exports and a commitment to quality and service, we are confident that we will establish a robust presence in India," Mr Tyas said.

"Members of the Australian avocado industry are forging trusted and enduring relationships with Indian stakeholders and these relationships will underpin the success of Australian avocados in India. A range of efforts are underway to solidify our commitment to this market, including trade missions, resources about avocado handling and monitoring, in-store activities to target consumers, and of course our new brand ambassador, Brett Lee."

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Leveraging data for market access

Phytosanitary data developed by Australian scientists in collaboration with the avocado industry, in a project funded by Hort Innovation, has enabled market access to India. This has increased sales and profitability for Australian growers while diversifying export markets beyond Hong Kong, Singapore and Malaysia.

Phytosanitary requirements are a key barrier to the export of avocados from Australia to countries such as India. Although the export of avocados has increased in recent years, the market has been limited, mainly to Hong Kong, Singapore and Malaysia. Producers are actively seeking to establish new markets.

Delivered through Hort Innovation using industry levies and funds from the Australian Government, some of Australia's top scientists partnered with the avocado industry to develop phytosanitary data demonstrating that the health and safety of Australian Hass avocados is in line with India's import requirements. Research involved rigorously applying treatments to avocados to prove they are pest and disease free with no impact on quality.

Market access will significantly increase for Australian avocado producers, reducing issues of oversupply and increasing profitability of operations. India has a fast-growing economy, with a fast uptick of purchasing and demand - therefore, market demand for Aussie avocados may increase further in the future, increasing sales for growers.

In March 2023, Australian and Indian governments issued a joint statement welcoming the finalisation of market access for Hass avocados. The new export market is estimated by the industry to have a market value of $25 million.

Mapping the Indian supply chain

To complement these steps forward in gaining entry for avocados into India, Australian growers are set to gain insights into the journey of their produce to India, with the aim to maintain quality and boost trade in the high-value market.

Commissioned by Hort Innovation and delivered by KPMG Australia, researchers will map the supply chain of horticultural products exported to India, identify the main opportunities and challenges, and recommend strategies to enhance the position of Australian products in the market.

The research is funded through a Federal Government Agricultural Trade and Market Access Cooperation (ATMAC) grant awarded to Hort Innovation, with the aim of getting more Australian produce to consumers around the world.

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Bolstering industry's export capability

To support growers and exporters in supplying overseas markets with high-quality Australian avocados, Hort Innovation invests grower levies and Australian government contributions into a market access and trade development program.

Delivered by Avocados Australia, the project is tasked with bolstering industry readiness, knowledge and technical capabilities around export, and delivering work to improve and maintain international market access. Specifically, the project supports the role of Export Development Manager Flora Zhang who works to help avocado growers take advantage of existing, new and emerging export opportunities.

The program has fostered collaboration between Australian avocado growers, industry, and export markets to develop new markets for the strong domestic supply of Australian avocados. This has been developed through education initiatives that have equipped industry with the knowledge of how to export goods effectively, build relationships with stakeholders domestically and internationally, and offers support services for the development of export-oriented businesses.

Brett Lee going into bat

One of the world's fastest and most iconic bowlers, former Australian cricketer Brett Lee, is taking Australian avocados to consumers in India, supported by Hort Innovation's international marketing program, funded through grower levies.

Now an international cricket commentator, businessman, author and philanthropist, Mr Lee is spruiking the attributes of avocados on various media platforms in India.

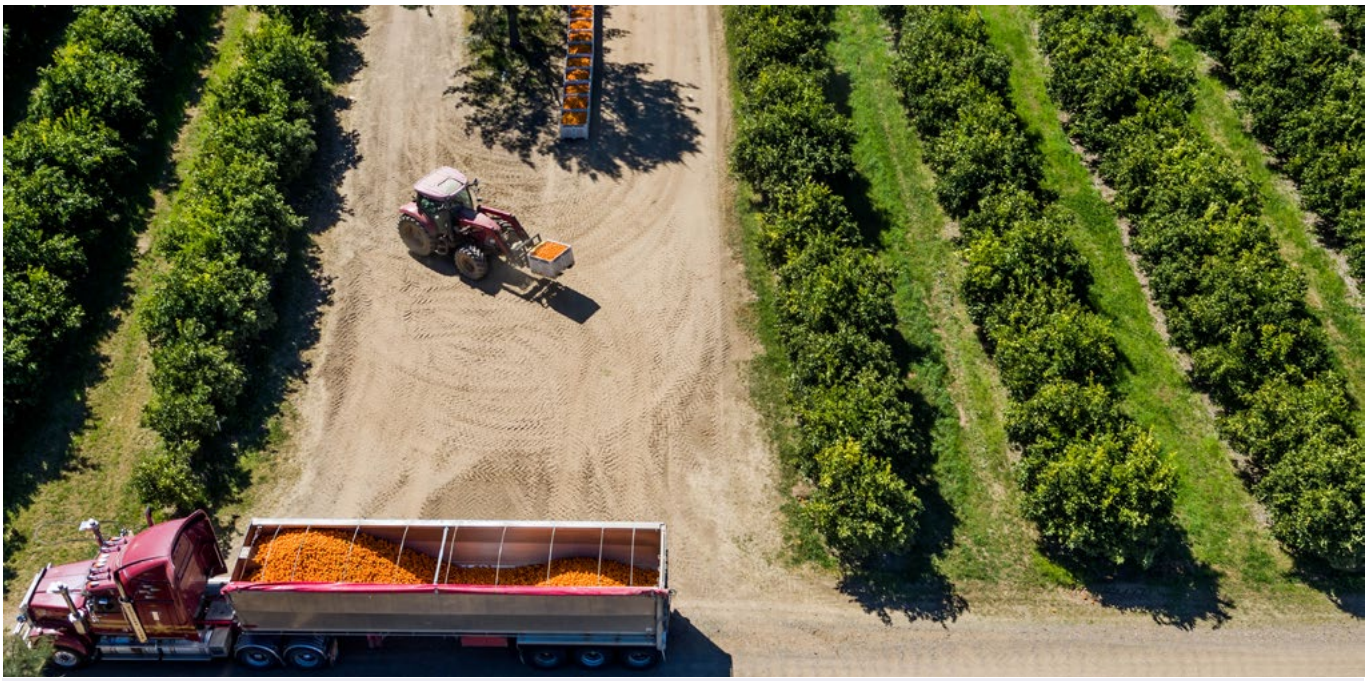
As the new avocado ambassador, Mr Lee is delivering positive messages about Australian avocados, sharing their virtues in terms of taste, nutrition and versatility. Light-hearted in its approach, the campaign features Mr Lee in the orchard, in the kitchen and at home relaxing. His genuine love of avocados is at the heart of the campaign to encourage consumption at all mealtimes.

Hort Innovation chief executive officer Brett Fifield said the cricketer is the perfect match for the Australian Avocados marketing campaign in India.

"Brett Lee needs no introduction to our target audience in India," Mr Fifield said.

"He is something of an icon there, where in addition to his cricketing exploits, he starred in a Bollywood movie, wrote and recorded a popular song and has appeared on numerous prime time television talk shows."

"Who better to prompt our Indian consumers that Australia is best when it comes to avocados, and what perfect timing given the Australian Government's announcement last year that Australian Hass avocados can be exported to India."



Through past and ongoing Hort Innovation investments on behalf of growers and the Australian Government, the National Citrus Repository Program has been established as an 'insurance policy' to protect our citrus industry against destructive, incurable diseases.

Citrus repository a comforting insurance policy for growers

Peace of mind cannot be measured in terms of dollar value, but Australia's citrus growers certainly understand its true worth.

A resource supported through their research and development levy has provided growers, industry and Australian communities and consumers with an assurance of continued citrus production should adversity strike.

Through past and ongoing Hort Innovation investments on behalf of growers and the Australian Government, the National Citrus Repository Program has been established as an 'insurance policy' to protect our citrus industry against destructive, incurable diseases.

Managed by Auscitrus on behalf of Hort Innovation's 'Protecting Australia's citrus genetic material' investment and in partnership with New South Wales Department of Primary Industries, the repository houses more than 120 publicly-owned true-to-type "foundation tree" variety clones so growers can access clean, disease-free planting material for assured quality and yield protection.

Graft-transmissible diseases, spread by insects and/or infected plant material, are of considerable concern to industry as they can kill trees and decimate entire orchards – and there is no cure.

According to Hort Innovation's *Australian Horticulture Statistics Handbook 2022-23*, the nation's citrus production of 815,750 tonnes was valued at $977.1 million for that year. Almost 30 per cent of production was exported fresh, valued at $441.1 million.

Hort Innovation research and development manager, Ben Callaghan, says that given the value and importance of our citrus industry, shielding it from potential disaster is imperative.

"If we didn't have the repository and we experienced an outbreak of an exotic disease such as huanglongbing (HLB) or citrus variegated chlorosis (CVC), the impact would be enormous in terms of cost to growers and industry, access to markets and the effect on consumers and regional communities," Dr Callaghan said.

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"It is difficult to put a true cost on the availability of clean, true-to-type planting material in these situations, as colleagues in overseas citrus industries will attest to.

"By providing growers with immediate access to clean planting material that is certified disease-free through this biosecure repository we can create a buffer against such potentially devastating repercussions by providing access to clean, true-to-type planting material for the Australian citrus industry when needed."

Biosecurity is a strong focus for the nation's citrus industry which has witnessed the devastating impact of HLB in other countries.

"This repository is an invaluable resource – it is a working insurance policy for industry," Dr Callaghan said.

An impact assessment of the previous iteration of the 'Protecting Australia's citrus genetic material' investment from 2018-2021 reported an estimated benefit-cost ratio of 6.17 to 1. Multiple positive impacts from the project included:

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Ben Callaghan, Hort Innovation research and development manager

A minimum of one tree of each citrus variety is held in insect-screened green houses at Dareton and Menangle in NSW. Image: Auscitrus

- Reduced risk of productivity losses and cost of replanting from the introduction and spread of graft transmissible diseases
- Reduced risk of higher chemical usage to manage insect vectors associated with some graft transmissible diseases
- Continued supply of affordable citrus for consumption, and community spillover benefits (ie employment) from a profitable citrus industry.

At the conclusion of the 2018-21 investment, 70 to 80 per cent of citrus plantings were using clean and true-to-type material sources from the repository program, through which a minimum of one tree of each citrus variety is held in insect-screened green houses at Dareton and Menangle in New South Wales.

Having repository houses situated in two different regions provides security of material should a catastrophic event such as fire, vandalism or disease incursion occur at one of the sites.

Through the current Hort Innovation investment, the National Citrus Repository Program is maintaining high health status foundation trees as a source of budwood for industry.

Budwood from the foundation trees is used by Auscitrus (an industry non-profit organisation) to create daughter trees and multiply large supplies of buds for industry.

New varieties can enter the program after pathogen testing and elimination if no known diseases are detected.

Through the previous investment, two new varieties were added to the repository based on commercial potential assessed by Auscitrus or community/industry interest. They were an imported mandarin variety (Shiranui) added in 2020 following propagation and processing at the Australian Post Entry Quarantine Facility managed by the Federal Government and a local pomelo variety (K15) added in 2019 following propagation and processing by the Citrus Pathology Team at the NSW DPI's Elizabeth Macarthur Agricultural Institute at Menangle.

'Protecting Australia's citrus genetic material' investment is collaborative project, linking into various citrus breeding, diagnostic and biosecurity programs being supported through Hort Innovation on behalf of industry.

Growers can purchase varieties from the repository through ***https://www.auscitrus.com.au/cfr-list/***.

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