



Vegetable Fund

Annual Report 2018/19

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The projects in this report have been funded by Hort Innovation using sources including the vegetable levy, Australian Government contributions and, in some instances, co-contributions from a variety of sources.



Just some of the things your fund delivered in 2018/19:

- ✓ **The industry communications program**, delivering the *Vegetables Australia* magazine, *Weekly Update* emails, InfoVeg (www.ausveg.com.au/infoveg) and a host of other resources (p15)
- ✓ **Vegetable Harvest to Home dashboards**, providing regular consumer behavioural data and insight reporting on 25+ commodities at www.harvesttohome.net.au
- ✓ **The nation-wide VegNET program** to support growers in the adoption of best practice (p16)
- ✓ **The Soil Wealth and Integrated Crop Protection initiatives**, delivering information and activities via www.soilwealth.com.au
- ✓ **A range of export development investments** and support work, including the launch of a new project to engage retailers in export markets (p9)
- ✓ **Numerous projects to help growers tackle pests, diseases and weeds** (see from p11 for just some examples)
- ✓ **New final research reports and grower resources**, with 180+ now available from www.horticulture.com.au/vegetable-fund



2018/19 SNAPSHOT

**\$18.2
MILLION**

INVESTED
IN R&D

100

ACTIVE R&D
INVESTMENTS

Welcome

Hort Innovation is the grower-owned, not-for-profit research and development corporation (RDC) for Australia's horticulture sector. It's our job to work with industry to invest the vegetable R&D levy, together with Australian Government contributions, into key initiatives for growers.

The 2018/19 financial year was another great year of growing better, together – with strong investments, closer connections and critical collaborations being forged.

There was more than \$18.2 million invested into R&D through the Hort Innovation Vegetable Fund across the year, to support the industry in being as productive and profitable as possible. In addition to some 55 ongoing projects and a host of completed work, this included the establishment of several new investments. Importantly, there was plenty of work allowing the vegetable industry to join forces with other horticulture industries for maximum efficiency and impact across shared issues and opportunities.

Read on to learn more about just some of the projects undertaken. And remember to take advantage of the Hort Innovation website at www.horticulture.com.au/vegetable-fund, where you can search and find information relating to investments, past and present, at any time. The new site and its Vegetable Fund section were launched in 2018/19.

During the year there were also many opportunities for Hort Innovation to connect with you, the growers. A big thank you in particular to everyone who came to our early-2019 regional roadshows to feed into the development of the new Hort Innovation Strategy 2019-2023 (read more at www.horticulture.com.au/strategy-2019-2023).

You can reach out to us at any time to learn more about our work, to submit ideas for investments, or to simply have a chat about your industry. You'll find details of specific staff at www.horticulture.com.au/get-in-touch, or can otherwise email communications@horticulture.com.au or call our general line on 02 8295 2300.



Additional value in the year

During 2018/19, Hort Innovation was proud to deliver extra value to the vegetable industry, outside of levy-funded initiatives within the Vegetable Fund. Here's a quick look at just some examples.



The new Hort Innovation website, with dedicated Vegetable Fund section

You can now visit www.horticulture.com.au/vegetable-fund to quickly search and find vegetable investment information and updates, project resources, and growing tips and advice from Hort Innovation's R&D work. You can also download full final research reports direct from the site, access key contact information, share your ideas and feedback, and so much more.



The Australian Horticulture Statistics Handbook

Each year Hort Innovation delivers an *Australian Horticulture Statistics Handbook* packed with horticulture statistical information and analysis for use by specific industries and the wider sector. The handbook combines all available data on production, international trade, processing volumes and fresh market distribution for some 75 categories. The 2017/18 edition, released in early 2019, is available from www.horticulture.com.au/horticulture-statistics-handbook.



Hort Frontiers projects

With seven investment areas, Hort Innovation's Hort Frontiers strategic partnership initiative is about collaborative, cross-industry work to address longer-term, complex issues and opportunities identified as critical for the future of Australian horticulture. While the vegetable levy has been co-invested into some Hort Frontiers projects, the bulk of funding continues to come from broad-reaching funding relationships secured by Hort Innovation, plus support from the Australian Government. Learn about all of the projects and what they're delivering for you at www.horticulture.com.au/hort-frontiers.



Grant funding

In 2018/19, Hort Innovation delivered \$6.7 million worth of investments involving grant funding across the horticulture sector. To do so, we applied for and secured a range of competitive grants on behalf of industry, including through the Australian Government's Rural R&D for Profit program, Improved Access to AgVet Chemicals initiative, and Agricultural Competitiveness White Paper. With projects across everything from biosecurity to pollination, there's plenty in there to directly and indirectly benefit the vegetable industry.

Making investments in 2018/19

Hort Innovation is dedicated to making the right investments at the right time and in the right areas, in line with identified priorities for the industry.

Where the funding comes from

The vegetable industry's grower-raised statutory R&D levy is collected by the Australian Government and entrusted to Hort Innovation as the RDC for Australian horticulture. It's then our responsibility to work with the industry to invest the levy, together with Australian Government contributions, into strategic initiatives for the benefit of growers.

Additional funding streams can also come into play, such as co-investment dollars from sources including project partners, and grant funding that Hort Innovation secures on behalf of industry.

How decisions are made

Investment decisions in the Hort Innovation Vegetable Fund are guided by the industry's Strategic Investment Plan (SIP). This document was developed through close consultation with growers and other industry stakeholders, and outlines specific investment priorities, strategies and themes. An at-a-glance version can be found at www.bit.ly/vegetable-plan, or find the full version at www.horticulture.com.au/vegetable-fund.

The SIP is currently used like a 'roadmap' by the vegetable Strategic Investment Advisory Panels (SIAPs) – panels made up of growers and other industry representatives that are tasked with providing advice to Hort Innovation on potential levy investments.

Turning ideas into investments

Great investments start with great ideas, and Hort Innovation encourages all growers and other industry participants to share their thoughts and suggestions for the work they want to see. Ideas can be submitted any time via Hort Innovation's investment idea form at www.bit.ly/concept-form.

Ideas that are selected for investment are worked into project proposals by Hort Innovation. These are then made public for potential delivery partners to submit responses. Current opportunities are always listed at www.horticulture.com.au/delivery-partners.

Responses are assessed, often with the assistance of industry, and the best delivery partner for the work is chosen. A contract is then issued and the work begins.

Keeping track of investments

All investments in the Hort Innovation Vegetable Fund are detailed on the 'Your investments' page at www.horticulture.com.au/vegetable-fund. We also send news and alerts to Hort Innovation members and contacts – if you haven't already, you can sign up for free at www.horticulture.com.au/sign-up.

Importantly, the industry's levy-funded communications program is tasked with providing growers with regular information on levy-related activity. See p15 for more.



New investment analysis

You can now clearly see how investments in the Hort Innovation Vegetable Fund align to the industry's SIP, with new and interactive investment analysis information available from www.bit.ly/vegetable-investment. The analysis currently shows the allocation of funding against each of the vegetable SIP outcomes from the start of the SIP (2016/17) to the end of 2018/19, and gives an indication of the projects that are aligned to each outcome.

R&D project list 2018/19

NEW INVESTMENTS IN 2018/19

VG16018	Educational opportunities around the perceptions and aversions to vegetables through digital media – long-form video*
VG16031	VegPRO sub-project: Pest and disease training
VG18001	Annual Vegetable Industry Seminar 2019
VG18002	Vegetable industry leadership and development missions 2019
VG18005	Independent mid-term evaluation of VG16063
FF18003	SITplus: Port Augusta Qfly SIT factory pilot operation
MT17022	10th Australasian Soilborne Disease Symposium sponsorship*
MT18011	Ex-post impact assessment^
MT18017	Taste Australia retail program
MT18018	Generation of data for pesticide permit applications in horticulture crops 2019/20
ST18001	Generation of data for pesticide applications in horticulture crops†

* These flagged projects both began and ended in 2018/19

^ This multi-industry project was a key monitoring and evaluation investment during 2018/19 – we encourage you to find the full details at www.horticulture.com.au/mt18011

† Activities for the vegetable industry under this investment are funded wholly through the government's AgVet grant program

ONGOING INVESTMENTS IN 2018/19

VG14065	Nuffield scholarships
VG15009	Improved soilborne disease diagnostic capacity for the Australian vegetable industry
VG15021	Sowing success through transformational technologies
VG15027	Vegetable industry communication program 2016-2019
VG15028	Vegetable industry education and training initiative (VegPRO)
VG15037	Optimising the benefits of vermiculture in commercial-scale vegetable farms
VG15038	Investigating novel glass technologies and photovoltaics in protected cropping
VG15039	Precision seeding benefits for processing pea production
VG15004	VegNET – Bowen Gumlu and Far North Queensland
VG15040	VegNET – Wide Bay Burnett
VG15041	VegNET – Lockyer Valley and SE Queensland
VG15042	VegNET – NSW
VG15044	VegNET – NT
VG15064	Improved management of pumpkin brown etch
VG15065	Review of the national biosecurity plan for the vegetable industry
VG15067	Development of a vegetable education resource – stage 2
VG15068	Improving safety of vegetable produce through on-farm sanitation, using electrolysed oxidising (EO) water
VG15070	A strategic approach to weed management for the Australian vegetable industry



Continued >>

ONGOING INVESTMENTS IN 2018/19 (continued)	
VG15073	Characterisation of a carlavirus of French bean
VG15077	Financial performance of Australian vegetable farms 2016-2017 to 2018-2019
VG16005	ProbiSafe – development of biocontrol agents to inhibit pathogen growth
VG16009	Adoption of precision systems technology in vegetable production
VG16020	Vegetable industry minor use program
VG16023	A review of leadership across the RDC landscape
VG16031	VegPRO sub-project: PMA A-NZ Produce Executive Program scholarships
VG16037	Novel topical vegetable and cotton virus protection
VG16042	Pathogen persistence from paddock to plate
VG16060	Vegetable agrichemical pest management needs and priorities
VG16061	Vegetable industry export program [†]
VG16062	Field and landscape management to support beneficial arthropods for IPM on vegetable farms
VG16063	The EnviroVeg Program 2017-2022
VG16064	Tools and interventions for increasing children's vegetable knowledge
VG16067	Impact of pesticides on beneficial arthropods of importance in Australian vegetable production
VG16068	Optimising cover cropping for the Australian vegetable industry
VG16070	Research and operations to trial innovation glass and photovoltaic technologies in protected cropping
VG16075	Monitoring and evaluation of vegetable consumer data projects
VG16078	Soil wealth and integrated crop protection – phase 2
VG16085	Export facilitators
VG16086	Area wide management for vegetable diseases: viruses and bacteria
VG17000	Vegetable business benchmarking

ONGOING INVESTMENTS IN 2018/19 (continued)	
VG17003	National Vegetable Protected Cropping Centre
LP15001	Global Masterclass in Horticultural Business
LP15006	Attracting new entrants into Australian horticulture
MT13059	SITplus: Developing and optimising production of a male-only temperature-sensitive-lethal strain of Q-fly, <i>B. tryoni</i>
MT14052	Essential market access data packages
MT16004	RD&E program for control, eradication and preparedness for vegetable leafminer
MT16005	Enhanced National Bee Pest Surveillance Program
MT16010	Horticultural trade data 2017-19
MT16018	National tomato potato psyllid (TPP) program coordinator
MT17012	Generation of data for permit pesticide applications in horticulture crops
MT17017	Vegetable cluster consumer insights program
PH16000	Stingless bees as effective managed pollinators for Australian horticulture
ST16006	Generation of residue, efficacy and crop safety data for pesticide applications in horticulture crops
ST16008	AgVet collaborative forum
ST17000	Generation of data for pesticide applications in horticulture crops 2018

[†] Further investments supporting Taste Australia trade show attendance sat under this program, including MT17008, MT17010, MT17011



INVESTMENTS COMPLETED IN 2018/19		INVESTMENTS COMPLETED IN 2018/19 <i>(continued)</i>	
VG13072	Export opportunities for carrots, sweet corn, beans, broccoli and baby leaf – symposia	VG15054	Data analytics and app technology to guide on-farm irrigation
VG15002	Advanced stable fly management for vegetable producers	VG15059	Evaluating and testing autonomous systems developed in VG15003 in Australian vegetable production systems
VG15003	Using autonomous systems to guide vegetable decision making on-farm	VG15066	Improved knowledge of factors contributing to carrot rot
VG15010	A multi-faceted approach to soilborne disease management	VG15076	Creating value from edible vegetable waste
VG15013	Improved management options for cucumber green mottle mosaic virus	VG16031	VegPRO sub-project: Chemical handling for vegetable crops
VG15020	Strengthened biosecurity for the vegetable industry – phase 2	VG16031	VegPRO sub-project: Basic irrigation skills workshops
VG15024	Vision systems, sensing and sensor networks to manage risks and increase productivity in vegetable production systems	VG16031	VegPRO sub-project: VegInnovations 2018 Regional Roadshow
VG15030	Growing Leaders	VG16031	VegPRO sub-project: Negotiation and influencing workshops
VG15032	Global Innovations in Horticulture seminar	VG16063	The EnviroVeg Program – national innovation coaching/Hort360
VG15034	Facilitating adoption of IPM through a participatory approach with local advisors and industry – training component	VG16071	Boosting vegetable consumption through diet
VG15035	Facilitating adoption of IPM through a participatory approach with local advisors and industry – coordination component	VG16080	Vegetable digital asset redevelopment – Veggycation
VG15036	Facilitating adoption of IPM through a participatory approach with local advisors and industry – evaluation component	VG16081	Vegetable market price reporting pilot program – market data
VG15043	VegNET – WA	VG16084	Vegetable market price reporting pilot program – reporting
VG15045	VegNET – SA	VG17004	Vegetable knowledge transfer at the 2018 International Spinach Conference
VG15046	VegNET – Tasmania	VG17013	Building the business case to grow domestic demand for vegetables in Australia
VG15047	VegNET – Gippsland	VG17014	Review of issues and options for preventing and removing redback spiders in broccoli
VG15048	VegNET – Victoria (South-East, West and Northern regions)		
VG15049	National Vegetable Extension Network (VegNET)		

During the 2018/19 financial year, all levy paying horticulture industries also contributed to a small selection of across-industry projects addressing issues that affect horticulture as a whole. Details of all investments that Hort Innovation manages can be found at www.horticulture.com.au.



But wait, there's more. To see what Hort Innovation delivered across the entire horticulture sector in 2018/19, download the full Hort Innovation Annual Report 2018/19 from www.horticulture.com.au/annual-report-portal.

R&D report

With some 100 investments active in the Hort Innovation Vegetable Fund during 2018/19, this report provides a quick look at small selection of the work in just some of the fund's investment areas. You can find information on every single project – and access any resources they've produced, such as fact sheets and guides – via your grower page at www.horticulture.com.au/vegetable-fund.

Examples of projects in the export market space

Taste Australia retail program (MT18017)

NEW IN 2018/19

Key research provider: Produce Marketing Australia (PMA)

This new multi-industry investment is targeting key international retailers with training and educational resources about selecting, storing, handling and displaying Australian fresh produce in store, including Aussie veggies.

This work is an R&D component of Hort Innovation's Taste Australia retailer engagement efforts in international markets. Taste Australia is the whole-of-horticulture brand used to increase the profile, sales and consumption of premium Australian horticulture products in export markets in Asia and the Middle East. It's a central component of Hort Innovation's Hort Frontiers Asian Markets Fund, which you can learn more about at www.horticulture.com.au/hort-frontiers.

Vegetable industry export program (VG16061)

ONGOING IN 2018/19

Key research provider: AUSVEG

Beginning in mid-2017, this project has been working to help the vegetable industry achieve the target of growing exports by 40 per cent – to the value of \$315 million – by 2020. This target was announced in 2017, with the release of the *Vegetable Industry Export Market Development Strategy 2020*. You can find an overview of the strategy at www.bit.ly/veg-export-strategy, or access the complete document by contacting AUSVEG on (03) 9882 0277.

Activities under the project broadly include market development and market access work, plus export readiness, training and education activities for growers and other stakeholders, to prepare the industry to take advantage of export opportunities. The project facilitates both outbound and reverse trade missions as part of this, and also supports the vegetable industry's attendance at key international trade shows under the wider Taste Australia banner.



Export facilitators (VG16085)

ONGOING IN 2018/19

Key research provider: vegetablesWA

This collaborative program is designed to increase Australian vegetable exports, by helping growers to capitalise on commercial business opportunities. It supports the roles and activities of export facilitators across Australia's vegetable growing regions, establishing a facilitator network across the country.

The facilitators are helping create export plans in conjunction with vegetable growing businesses, promoting collaboration within the industry, and providing linkages across the supply chain to assist in achieving the goals of the *Vegetable Industry Export Market Development Strategy 2020*.

Growers interested in exporting can contact the state coordinating bodies so far involved in the program:

- » For Tasmania, contact Ian Locke at ian.locke@tasfruitveggroup.com.au
- » For Queensland, contact Peter Hockings at phockings@growcom.com.au
- » For Western Australia, contact Manus Stockdale at manus.stockdale@vegetableswa.com.au.

This investment also supports the *Vegetable industry export program* (VG16061), described on the previous page.

Examples of projects focusing on the domestic market, plus consumer education

Vegetable cluster consumer insights program (MT17017)

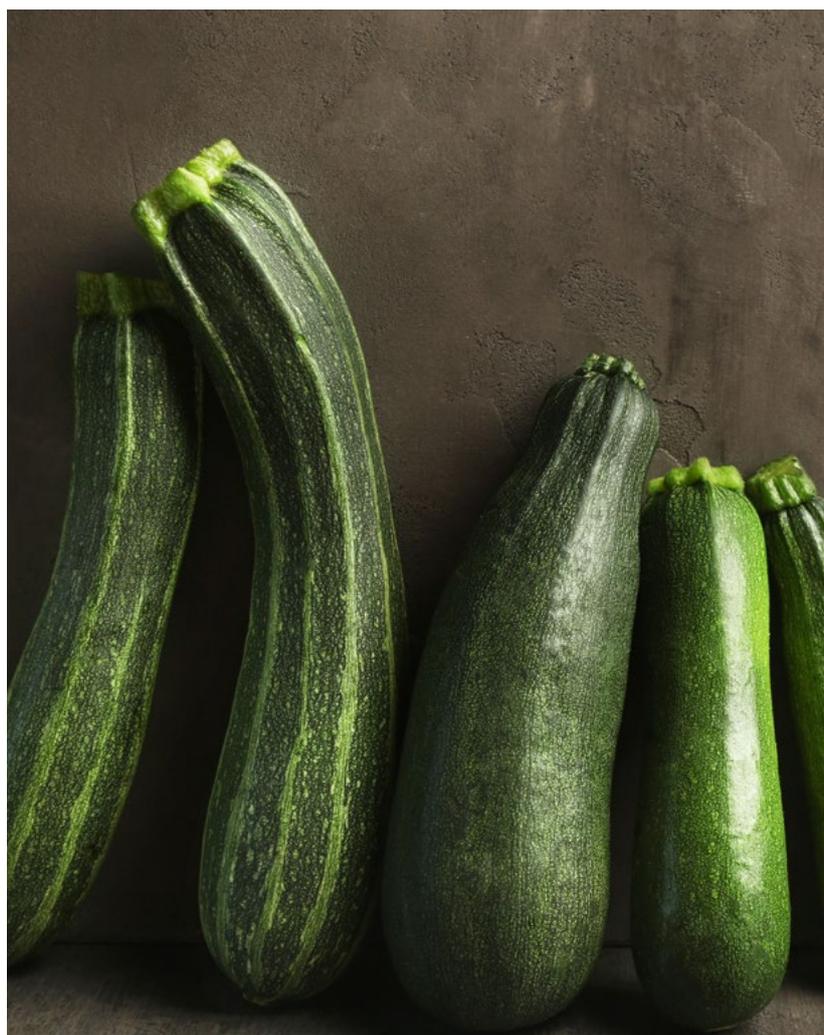
ONGOING IN 2018/19

Key research provider: Nielsen

This multi-industry investment is tasked with providing regular consumer behavioural data and insight reporting to a range of industries, through the Harvest to Home platform.

The platform has dedicated dashboards for 25+ vegetable commodities, making data and reporting easily accessible for industry participants. You can access the dashboards at www.harvesttohome.net.au/vegetables, then use the menus at the top to navigate through the different information offerings.

The information is intended to assist growers and supply chain partners in decision-making for their businesses and, for the wider industry, the data and insights are available to support strategic activities.



Vegetable market price reporting pilot program (VG16081 and VG16084)

NOW COMPLETE

Key research providers: Ausmarket Consultants and Freshlogic

This one-year pilot program provided market price and insights reporting for Australian vegetable growers. It was made up of two projects: *Vegetable market price reporting pilot program – market data* (VG16081) and *Vegetable market price reporting pilot program – reporting* (VG16084).

Between May 2018 and May 2019, the program delivered accurate and timely wholesale market price reports for 10 key vegetable categories from markets in Brisbane, Sydney, Melbourne and Adelaide. Reports were published to the Hort Innovation website twice a week for the two biggest trading days – Monday and Thursday – in addition to monthly reporting. The reports condensed a wide range of market price data into an easy-to-read format to help vegetable growers understand short and long-term wholesale market price patterns between markets and product lines.

For a limited time, the final three monthly summary reports can still be accessed from www.bit.ly/veg-price-reports.

Educational opportunities around the perceptions and aversions to vegetables through digital media – long-form video (VG16018)

NEW IN 2018/19 & NOW COMPLETE

Key research provider: Edible Adventures Productions

This investment was a continuation of the original VG16018 project, which developed and delivered the high-profile Phenomenom web series and related teaching resources for increasing kids' education around and attitudes towards vegetables – you can find these all at www.phenomenom.com.au. In 2018/19, this additional component allowed for the production of a second long-form, summary video based on the existing content, for inclusion in Qantas's in-flight video offerings between March and August 2019. An initial long-form video screened from September 2018 as part of the previous investment, yielding a large number views and a high retention rate of the vegetable education messaging among children.

Boosting vegetable consumption through diet (VG16071)

NOW COMPLETE

Key research provider: SP Health

This investment, which finished just inside 2018/19, delivered an innovative education tool to help consumers understand and increase their vegetable intake. This was the app called VegEze, which challenges people to eat more vegetables. iPhone users can download the app from the Apple App Store, or learn more at www.totalwellbeingdiet.com/au/vegeze.

The app has a game-style approach, motivating participants to add extra vegetables to their daily diets and form long-term, healthier habits through a 21-day challenge to eat three different vegetables at each dinnertime. There are daily reminders and rewards throughout, and the app comes with educational resources such as a visual guide to serving sizes for specific vegetables, plus recipes and nutritional information.

The idea behind the app came from previous levy-funded research with the CSIRO, which demonstrated a positive relationship between the number of different types of vegetables Australian adults eat and their overall vegetable intake.

To help further understand vegetable consumption and how education initiatives can boost it, the project team also looked at how effective the VegEze app's game-like nature was at helping transform people's eating patterns. Key results included:

- » On average, vegetable intake increased by about half a serve per day over the 21-day challenge period
- » At 21 days, more than 80 per cent of participants 'always' or 'usually' consumed three vegetable serves at dinner, which increased to almost 90 per cent of participants who reported their intake at a 90-day follow-up

- » Almost a quarter of the sample that completed the 21-day survey met the Australian Dietary Guidelines recommendations for vegetable intake
- » Those with low vegetable intake at the start significantly increased their intake by one to 1.2 serves a day at 21 days
- » Obese participants who completed the 90-day survey increased their vegetable intake by 0.6 serves a day at 21 days and by 0.8 serves a day at 90 days.

Full details can be found in the project's full final research report, which is available from www.bit.ly/vg16071.

Vegetable digital asset redevelopment – Veggycation (VG16080)

NOW COMPLETE

Key research provider: Hardhat Digital

The vegetable industry's Veggycation platform (www.veggycation.com.au) was established under a previous levy investment, to help communicate the nutrition and health benefits of vegetables to Australians. Audiences for Veggycation include consumers, teachers, students, food manufacturers, growers and other industry stakeholders. The Veggycation website was originally completed in 2014, with this subsequent investment responsible for giving it a refresh to help ensure the resource remained current.

Examples of projects addressing on-farm issues, opportunities and practices

Optimising cover cropping for the Australian vegetable industry (VG16068)

ONGOING IN 2018/19

Key research provider: Applied Horticultural Research

This investment began in mid-2017 to support Australian vegetable growers in effectively using cover crops to boost soil health and reap productivity benefits. Bringing together a consortium of research partners, it is using a range of cover cropping trial sites to explore the how, why and when to best use cover crops across Australia's main vegetable growing regions.

The work is exploring cover crop species, cropping sequences, sowing windows and transition practices under a range of soil types, climates and crops, and will ultimately deliver clear grower guidelines for using cover cropping that are specific to growing regions.

A strategic approach to weed management for the Australian vegetable industry (VG15070)

ONGOING IN 2018/19

Key research provider: University of New England

This investment is delivering weed management tools and approaches for the vegetable industry. Beginning in 2016 and running for four years, it has been identifying and improving integrated management strategies for high-priority weeds, and developing guidelines and a host of resources for growers. Its work will ultimately help reduce the dependence on herbicides and tillage for weed control, which can become ineffective when used repeatedly.

A multi-faceted approach to soilborne disease management (VG15010)

NOW COMPLETE

Key research provider: Applied Horticultural Research

This project, which ran from 2015 to 2018, looked at potential management strategies for soilborne diseases, including chemical, cultural and biological options, to find better options for growers. The key recommendation to arise from the project is that growers should shift emphasis from disease management to prevention. Once a soilborne disease is in a crop there are few post-plant treatment options to prevent its progression, so measures to keep diseases out need to be prioritised.

The project had a suite of sub-projects, looking at:

- » Use of cover crops to reduce soilborne diseases
- » Control of sclerotium rot of chillies
- » Managing damping off in babyleaf spinach
- » Grafting cucumbers to disease-resistant rootstocks.

The team communicated their findings and recommendations through best-practice demonstration sites, field days, workshops and masterclasses, where participants looked at integrating management options and tailoring them to specific

production systems. Events were attended by more than 650 growers and advisers across the project's run. Some 80 per cent of masterclass participants reported that they had introduced or fine-tuned practices to better manage soilborne diseases, and more than two-thirds of growers and advisers felt they were better equipped to deal with them.

Importantly, there was integration with the levy-funded Soil Wealth and Integrated Crop Protection programs (www.soilwealth.com.au/my-topic/soilborne-disease) and the production of a range of supporting resources for growers to help build integrated management approaches tailored to individual cropping systems, risks levels, market requirements, soils and climates. These included:

- » A practical how-to guide to identifying and controlling soilborne diseases in vegetable crops
- » A host of fact sheets
- » Several webinars and videos
- » A number of educational and instructional articles.
- » A budget spreadsheet tool to look at the financial impact of practice change on farm

These can all be found, together with the project's full final research report, at www.bit.ly/vg15010.

Specific recommendations from the project team to help growers and advisers move to a preventative approach included:

- » Understand your soilborne diseases. Correctly identifying and understanding the disease life cycle will help in targeting management options most effectively.
- » Understand what paddocks and seasons are most susceptible to soilborne diseases for your key crops. New tests for soilborne diseases are available to help with this, such as Predicta, which is being facilitated by the project *Improving soilborne disease diagnostic capacity for the Australian vegetable industry* (VG15009), described at www.bit.ly/vg15009.
- » Focus preventative actions during the fallow and planting preparation phase, to set up the soil and crop, ahead of time.



Review of issues and options for preventing and removing redback spiders in broccoli (VG17014)

NOW COMPLETE

Key research provider: Applied Horticultural Research

With an increase in redback spider numbers being reported in broccoli, this short investment reviewed all available information on the problem. It examined factors that may be contributing to the spiders entering broccoli crops, or contaminating broccoli after harvest, and produced the below key findings to help explain the situation:

- » As female redback spiders can mature in six to eight weeks at 25°C, spiderlings that enter a broccoli crop at planting can potentially mature by harvest.
- » A single egg sac can cause a significant infestation – the average sac produces 110 spiderlings, with female spiders typically laying four to seven egg sacs over summer.
- » Long-distance dispersal of redbacks can occur through transfer on equipment and machinery, with spiders most likely to enter crops with this human assistance.
- » Redback spiders can survive long periods without food and in extremes of heat and cold, so easily tolerate the times and temperatures in broccoli supply chains.
- » Redback webs are easy to tell apart from those of other spiders. Social media photos did not show any webbing within contaminated broccoli heads, which may indicate the spiders were not living in the broccoli in the field, but entered at or soon after harvest.
- » The shift to integrated pest management using selective insecticides may have increased survival of both redbacks and their non-target prey organisms. Key prey for the spiders include beetles, millipedes and other ground-dwelling insects not usually regarded as pests.

The researchers noted that peaks of redbacks being found in broccoli appeared to correspond with hot, dry summer conditions. “The risk appears to be increased when an autumn crop of broccoli follows a summer crop of cucurbits, such as pumpkin,” they noted. “It is unclear whether this is because significant redback populations remain in the field, or whether redbacks sheltering on equipment and harvest bins enter broccoli after harvest. However, it is noted that the major outbreak of redback spiders in broccoli [in south east Queensland] occurred after a dry summer when pumpkins were in major oversupply, resulting in abandoned crops and extended storage of harvested produce.”

In regard to reducing the risk of redback infestation, the project team recommended thoroughly cleaning equipment and machinery used to grow and harvest broccoli and, if spiders are found in the field, destroying crop residues that they could use as harborage.

The project produced a handbook for growers to better understand the risk and management of redback spiders in broccoli, which can be downloaded from Hort Innovation at www.bit.ly/redback-spiders.

Vegetable industry minor use program (VG16020)

ONGOING IN 2018/19

Key research provider: Hort Innovation

Through this project, levy funds and Australian Government contributions are used to submit renewals and applications for minor use permits for the vegetable industry as required. These submissions are prepared and submitted to the Australian Pesticides and Veterinary Medicines Authority (APVMA).

In 2018/19, more than 40 new permit and permit renewal applications were facilitated under VG16020, and at the time of writing there were close to 190 permits available to the industry.

You can access a table of all current vegetable minor use permits from www.bit.ly/minor-use-vegetable, where you'll also find details of other activities and resources in the chemical space. All current permits and the conditions of their use are also searchable at portal.apvma.gov.au/permits, while permit updates are circulated as they happen in Hort Innovation's *Growing Innovation* e-newsletter, which you can sign up for at www.horticulture.com.au/sign-up.

Data generation investments (ST16006, ST17000, ST18001 and MT18018)

NEW IN 2018/19 (MT18018 & ST18001)

ONGOING IN 2018/19 (ST16006 & ST17000)

Key research providers: Eurofins, Peracto

The generation of pesticide residue, efficacy and crop safety data is required to support label registration and minor use permit applications made to the APVMA which, when approved, provide access to safe and effective chemicals for the management of pests, weeds and diseases.

In 2019, Hort Innovation secured more than \$900,000 in assistance grants under the Australian Government's Access to Industry Uses of Agricultural and Veterinary (AgVet) Chemicals program. Under *Generation of data for pesticide applications in horticulture crops* (ST18001), this funding is being used to generate the data required for a range of product registrations across a variety of horticulture crops, including vegetables. Similar work is being conducted through *Generation of residue, efficacy and crop safety data for pesticide applications in horticulture crops* (ST16006), *Generation of data for pesticide applications in horticulture crops 2018* (ST17000) and *Generation of data for pesticide permit applications in horticulture crops 2019/20* (MT18018), with the former two being supported by funding secured through earlier rounds of the AgVet program.

Examples of projects supporting growers in accessing and adopting information, practices and technologies

Soil wealth and integrated crop protection – phase 2 (VG16078)

ONGOING IN 2018/19

Key research provider: Applied Horticulture Research

This investment continues to provide vegetable producers with the latest information in soil and pest related areas, in formats that are readily accessible and easy to use, through www.soilwealth.com.au, workshops, webinars and other resources.

It brings into one investment the industry's well-respected Soil Wealth initiative and the industry's Integrated Crop Protection initiative. The focus is on helping growers deal with future challenges posed by changes in the natural and business/market environment. Helping growers implement the efficient use of appropriate, trialled and tested new technologies as they become available, is also key.

The EnviroVeg Program 2017-2022 (VG16063)

ONGOING IN 2018/19

Key research provider: AUSVEG, with additional components with Freshcare and Growcom

The EnviroVeg Program is the vegetable industry's environmental best management practice (BMP) program, and has existed in evolving forms since 2000. It involves a range of resources and services so that Australian vegetable growers can benchmark and improve their BMPs and showcase their environmental credentials through certification.

This latest iteration of the program aligns components from EnviroVeg, Hort360 and Freshcare Environmental to deliver a clear pathway to environmental assurance for Australian vegetable growers, as it continues to support and improve environmental management on-farm and develop environmental recognition for industry participants.

It also includes the EnviroVeg Pilot Program, a funded pathway through EnviroVeg to reach Freshcare Environmental certification and attain the best practice benefits of environmentally responsible, sustainable vegetable production.

Learn more about EnviroVeg, sign up for free and complete a self-assessment at www.enviroveg.com.au. The website also includes quarterly updates on the program and resources including case studies and how-to guides.





Vegetable industry communication program 2016-2019 (VG15027)

ONGOING IN 2018/19

Key research provider: AUSVEG

Ongoing throughout 2018/19, this investment was responsible for effectively communicating the findings of levy-funded R&D and other relevant industry news, issues and data to vegetable growers and other industry stakeholders. The ultimate goal was to increase awareness of project outcomes and inspire on-farm adoption of new learnings and technologies.

A number of regular communication channels continued to be produced and maintained by this project, including but not limited to:

- » Weekly e-newsletter *Weekly Update*, which you can sign up to at www.ausveg.com.au/subscribe-to-ausveg
- » The bi-monthly *Vegetables Australia* magazine, with current and back issues available from www.ausveg.com.au/publications
- » *Vegenotes* factsheets, available from the above link
- » Annual publication *Grower Success Stories*, also available from the above link
- » InfoVeg services via www.ausveg.com.au/infoveg
- » Social media updates in AUSVEG channels, including Twitter.

The project also provided media relations for R&D-related news, including the production and distribution of media releases. With its work wrapping up just inside 2019/20, its activities are now continued by the new *National vegetable industry communications program* (VG18000).

Masterclass in Horticultural Business (LP15001)

ONGOING IN 2018/19

Key research providers: University of Tasmania in partnership with Lincoln University and Wageningen Research Academy

The Masterclass in Horticultural Business course was developed under the Hort Frontiers Leadership Fund and is aimed at fostering new innovators and leaders for the Australian horticulture industry. Best described as a 'mini MBA', it's a nine-month course where participants develop their business skills and build their own business plans for the future. The course is delivered predominantly online, with several face-to-face sessions and field trips to some of Australia's savviest horticulture outfits.

Vegetable levy has been co-invested into the Masterclass investment to support scholarships for industry levy-payers. For the 2018 Masterclass, 10 vegetable scholarships were awarded, with nine offered for the 2019 course.

The National Vegetable Extension Network (VegNET) program (various projects)

SOME ONGOING IN 2018/19, SOME COMPLETE

Key research provider: Various

VegNET was established in 2016 to keep growers informed about current R&D activities, results and resources – supporting the adoption of industry best practice and bolstering vegetable production in key growing areas across the country.

The program involves multiple levy-funded projects that support the positions of industry development officers (IDOs) in key vegetable-growing regions, who are responsible for the delivery of specialised events and distribution of R&D materials in those areas.

Several VegNET programs came to an end in 2018/19 and others just inside the new financial year, with a new short-term iteration of the program established to continue activities while a national vegetable industry extension strategy is under development. The current IDOs under this new work, *VegNET 2019-2020* (VG18003), are listed in the following table. Growers are welcome to contact their local IDO for information and updates at any time.

VegNET IDOs by region

Region	IDO/Email
Wide Bay Burnett	Bree Grima bree.grima@bfgv.com.au Hannah Lemon vegnet@bfgv.com.au
Bowen Gumlu and Far North Queensland	At the time of writing, the IDO was still to be confirmed
Southern Queensland	Zara Hall ido@lockyervalleygrowers.com.au
New South Wales	Matthew Plunkett matthew.plunkett@lls.nsw.gov.au Sylvia Jelinek sylvia.jelinek@lls.nsw.gov.au
Western Australia	Truyen Vo truyen.vo@vegetableswa.com.au Samantha Grubisa sam.grubisa@vegetableswa.com.au
Northern Territory	Greg Owens greg@ntfarmers.org.au Laura Cunningham ido@ntfarmers.org.au
South Australia	Yanyu Liang yanyu.liang@ausveg.com.au
Tasmania	Theresa Chapman theresac@rmcg.com.au
Gippsland	Shayne Hyman shayne.hyman@eastgippslandfoodcluster.com.au
Victoria	Carl Larsen carll@rmcg.com.au Clinton Muller clintonm@rmcg.com.au



To keep up to date with the latest information on new, ongoing and recently completed R&D investments throughout the year – and to search and find resources and reports from these investments – visit www.horticulture.com.au/vegetable-fund

Financial statement

Financial operating statement 2018/19

	R&D (\$)	TOTAL (\$)
	2018/19 July – June	2018/19 July – June
OPENING BALANCE	1,741,454	1,741,454
Levies from growers (net of collection costs)	9,423,816	9,423,816
Australian Government money	9,955,622	9,955,622
Other income*	1,208,499	1,208,499
TOTAL INCOME	20,587,938	20,587,938
Project funding	18,227,159	18,227,159
Consultation with and advice from growers	172,849	172,849
Service delivery – base	743,991	743,991
Service delivery – shared	1,234,994	1,234,994
Service delivery – fund specific	880,000	880,000
TOTAL EXPENDITURE	21,258,993	21,258,993
Levy contribution to across-industry activity	486,878	486,878
CLOSING BALANCE	583,521	583,521
Levy collection costs	350,740	350,740

* Interest, royalties



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