

FEBRUARY 2022

Vegetable

Strategic Investment Plan 2017-2021

PERFORMANCE REPORT



Vegetable SIP performance report

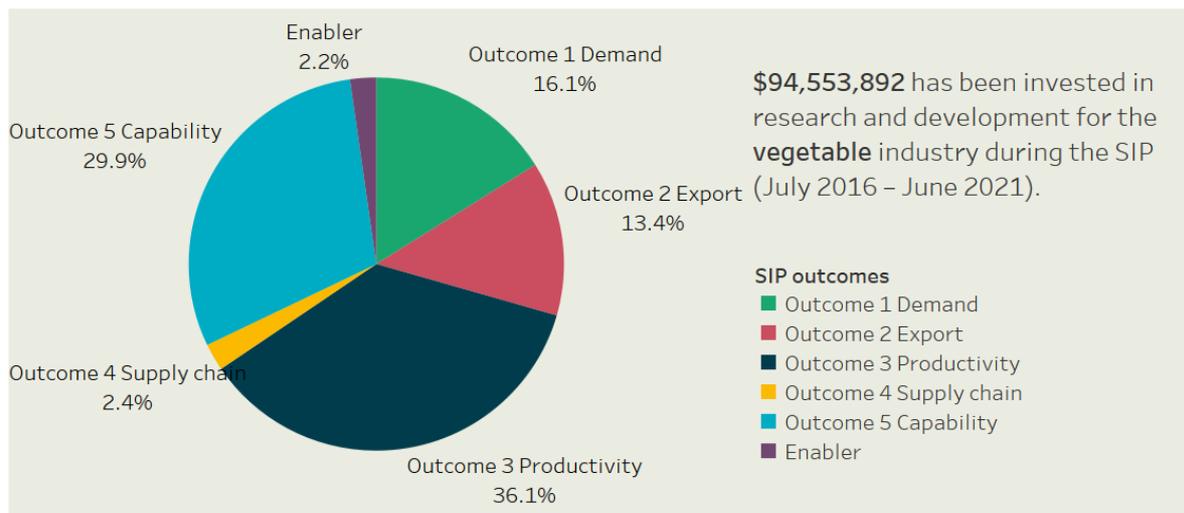
This performance report reviews the performance of levy investments delivered against the vegetable Strategic Investment Plan (SIP), which was active for the 5-year period from 2016/17 to 2020/21. The SIP was developed to strategically guide research and development (R&D) levy investment in accordance with core industry priorities. The SIP featured five outcome areas, 29 strategies and 69 key performance indicators (KPIs), summarised in Table 1. A total of \$94.6 million was invested into the Vegetable Fund over the 5-year period of the SIP. The total investment expenditure allocated against each outcome is provided in Figure 1.

Table 1: Vegetable SIP outcomes

Outcome	Description	Expenditure allocation*
1. Domestic demand	Increased demand and value of the domestic vegetable industry through improved grower knowledge of the market, product differentiation, increased food service revenue, improved food safety and increased consumer knowledge	16%
2. Export demand	Export markets grown through increased understanding of opportunities available, improved market access, improved export capabilities, improved reputation and competitive advantage	13%
3. Productivity	Increased farm productivity and decreased production costs through better utilisation of resources, adaptation to climate, reduced impact of pests and diseases and better utilisation of advanced technologies on the farm	36%
4. Supply chain	Increased supply chain integration and development through improved supply chain management, development of collaborative models and partnerships	2%
5. Industry capability	Improved capability of levy payers to adopt improved practices and new innovation through improved communication and extension programs, grower innovation support, professional development and workforce building programs, and through improved farm management and information systems	30%

**Total investment \$94.6 million as of June 2021. Balance of expenditure comprises of enabler investments, which includes expenditure to support the delivery of the SIP including advisory meeting and publication costs.*

Figure 1: Vegetable SIP investment expenditure analysis



SIP performance analysis

This performance report reviews the investment achievements delivered within each outcome area that have generated impact for growers. The overall status of each strategic area, informed through an assessment of KPI performance, is also provided. The evaluation status and criteria were:

Strategic area status	Criteria
Achieved	KPIs for this strategic area were met
In progress	Investment delivery remains ongoing
Not achieved	Investment was not prioritised in this strategic area

The results have been informed from evidence compiled through reviewing investment documentation and engagement with project managers. Outcomes generated through the investments are documented and brief case studies of flagship performance and impact for each outcome area are also provided.

Outcome 1: Domestic demand – Increased demand and value of the domestic vegetable industry

The vegetable SIP 2017-2021 recognised that vegetable industry supplies most of its production volume domestically, and that investment that supports domestic demand is critical to support sustainable farmgate prices and grower income.

Summary of strategic area and achievement status:

The strategies in the SIP that were identified to support domestic demand are listed below. An achievement status is provided based upon internal evaluation of project performances:

Strategic area	Status
Increase knowledge to better understand consumer trends and segments	Achieved
Identify value-adding opportunities such as pre-cut and improved packaging to achieve price premiums	Achieved
Support product differentiation that align with Australian consumer needs	Achieved
Improve stakeholder education for vegetables such as the identification and extension of the health benefits associated with vegetables	Achieved
Increase the market share for vegetables in foodservice such as the identification of potential product offerings specific to the sector	Not achieved
Improved food safety standards and traceability	In progress

KPI callouts:

- The *Australian Horticulture Statistics Handbook* (HA18002) reported that the production value of vegetables that are subject to the statutory levy increased at compound annual growth rate of 6.2% over the 5-year period of the SIP, growing from an estimated production value of \$2 billion in 2015/16 to \$2.7 billion in 2020/21.
- Value-adding opportunities were identified in the projects *Vegetable snacking options market research – Stage 2* (VG15060), *Market opportunities for vegetable juices* (VG16016), and *Creating value from edible vegetable waste* (VG15076).
- The strategic area of product differentiation was achieved through the projects *Increasing consumption by developing community awareness and benefits of vegetables* (VG16025) and *Understanding consumer triggers and barriers to consumption of Australian indigenous vegetables and Asian vegetables* (VG15071).
- The *Phenomenom* web series was developed under the investment *Educational opportunities around perceptions of, and aversions to, vegetables through digital media* (VG16018) targeting school-aged children with 25 webisodes and 50 PDF lesson plans aligned with curriculum content, which have been accessed over 22,000 times since being launched in May 2018.
- The *Veggycation* website, refreshed under the investment *Vegetable digital asset redevelopment – Veggycation* (VG16080) provides information on the attributes and traits of 82 vegetables to consumers.
- Innovation to support food safety compliance have contributed to fewer production recalls through GLOBAL G.A.P. certification progressed through the projects *Removing barriers of food safety certification for vegetable exporters through GLOBAL G.A.P. co-certification* (VG16019), *Pathogen persistence from paddock to plate* (VG16042), and *ProbiSafe – developing biocontrol agents to inhibit pathogen growth* (VG16005).

Case study: Vegetable cluster consumer insights program (MT17017)

An increased knowledge and understanding of consumer trends and segments can lead to better alignment of products and availability with consumer preference.

To address this the multi-industry investment *Vegetable cluster consumer insights program* (MT17017) has led to the production of the *Harvest to Home* platform, which has dedicated dashboards for over 25 vegetable commodities and a further 28 horticultural commodities with information on a variety of metrics.

The platform supplies data on household buying behaviour such as purchase frequency, volumes, and value, type of retailer, as well as the types of households that are purchasing individual vegetables. Attitudinal ratings by households on aspects such as value for money, quality, freshness, colour and portion/pack size were also reported.

Statistics show that 200 unique users on a monthly basis have accessed the platform. The data is used by growers to develop an understanding of the drivers and barriers of purchaser decisions, awareness of consumption trends and to gain insights into perceptions of packaging formats and freshness.

Outcome 2: Export demand – Export markets grown through increased understanding of opportunities available, improved market access, improved export capabilities, improved reputation and competitive advantage

The vegetable SIP 2017-2021 recognised that Australian vegetables have a high propensity for export on account of quality, production practices and food safety credentials. Growing the exports of vegetables offered the opportunity for extensive market and industry growth.

Summary of strategic area and achievement status:

The strategies in the SIP that were identified to support growth in vegetable exports are listed below. An achievement status is provided based upon internal evaluation of project performances:

Strategic area	Status
Facilitate a united representation of the vegetable industry to international markets	Achieved
Better understand the export opportunities available to the vegetable industry	Achieved
Improve market access in priority markets for vegetables	In progress
Improve the export capability of Australian vegetable growers	Achieved
Improve and capitalise on the opportunities available for inbound and outbound trade linkages	Achieved
Improve and capitalise on the use of e-commerce to export produce to existing priority markets	Not achieved
Capitalise on Australia's geographic advantage to Asia and realise the export potential available in regional areas	In progress

KPI callouts:

- The *Australian Horticulture Statistics Handbook* (HA18002) reported that over the past eight years the export value of vegetables that are subject to the statutory levy has grown from \$82 million in 2012/13 to \$170 million in 2020/21 with a compound annual growth rate of 10%. Exports represented approximately 6.3% (by value) of production in 2020/21, slightly lower than the high of 7.4% exported in 2017/18.
- The investment *The Vegetable industry export strategy* (VG15052) provided important market intelligence to focus the prioritisation of industry export activity. This program was supported by *Vegetable industry export program* (VG16061). (See the case study below.)
- Export capability of exporters was improved through the investment *Export facilitators* (VG16085). This program engaged directly with, and supported vegetable growers by, establishing a facilitator network across Australia to assist in being able to export vegetables.
- Export opportunities have been progressed through a variety of pest and disease projects such as *Management strategy for serpentine leafminer, Liriomyza huidobrensis* (MT20005), *Alternative disinfection for market access for crops affected by tomato potato psyllid* (VG17015) and *New end-point treatment solutions to control fruit fly* (VG13044), which has sustained capsicum exports to New Zealand with better quality outcomes by providing an export protocol.

Case study: Vegetable export development program (VG16061)

This large project ran for four years from 2017 to 2021 to further develop a sustainable vegetable export sector by supporting the implementation of the *Vegetable Industry Export Strategy 2020* which was developed under project VG15052. It has supported grower capability in export readiness, engagement at trade shows, and progressing market access applications. The program was delivered across five streams: export readiness, training and education; market development; market access; communication and industry engagement; and implementation of the strategy.

Whilst the project was disrupted by the global Covid-19 pandemic and its resulting impact on travel and trade, the project delivered a range of activities including:

- Eleven export readiness workshops for 132 levy-paying vegetable growers in Victoria, South Australia, Queensland, and Western Australia. Export readiness training workshops transitioned to an online model due to Covid-19 interruptions
- Sixteen outbound trade missions hosting 77 levy-paying growers across Dubai, Japan, Singapore, Thailand, Hong Kong, and China. Trade missions supported developing understanding of the local supply chain and distribution channels in these key export markets
- Five reverse trade missions in Western Australia, South Australia, Queensland, and Victoria. These missions included 119 international delegates from nine export markets, visiting a range of horticultural producers, building understanding of export supply chains, developing knowledge of integrated pest management (IPM) and broadening knowledge on irradiation and cold treatment to meet phytosanitary market access requirements. Strong involvement in these programs by exporting growers contributed to build international relationships to foster direct supply contracts
- Ten market access applications to the International Market Access Assessment Panel (IMAAP)
- Fifty-nine relevant industry e-newsletters with an open rate of over 70%
- The *Vegetable Industry Export Strategy 2025*, based off the earlier 2020 strategy, to guide industry export development activities and investment in the future.

An independent review of the program was based off a survey of 22 businesses was conducted at the end of the program in 2021. All respondents reported they had received benefits from the program. Ninety-five per cent reported gaining knowledge and understanding, 86% reported gaining relationships or partners and 77% reported an evident financial benefit. Ninety-six per cent of growers believed the program positively impacted their business through creating connections, generating commercial benefits, fostering capability uplift, increasing knowledge and enhancing communication.

Outcome 3: Productivity – Increased farm productivity and decreased production costs through better utilisation of resources, adaptation to climate, reduced impact of pests and diseases and better utilisation of advanced technologies on the farm

The vegetable SIP 2017-2021 recognised that farm productivity underpins supply growth through increasing the output of production relative to the inputs applied.

Summary of strategic area and achievement status:

The strategies in the SIP that were identified to support vegetable productivity are listed below. An achievement status is provided based upon internal evaluation of project performances:

Strategic area	Status
Reduce on-farm food waste, including other uses such as value-added foods and beverages, biofuels and nutraceuticals	In progress
Reduce major production costs through initiatives such as precision agriculture	In progress
Adapt and improve current protected cropping and intensive production technologies to the Australian environment	In progress
Protect the vegetable industry from endemic and exotic pests and diseases that significantly damage the industry	Achieved
Introduce new cultivars that have favourable production-related traits, such as resistance to pests and diseases, severe weather conditions, and varieties that allow for automation	In progress
Enhance the sustainability of the industry to help growers prepare for and mitigate against the cost of climate change	Achieved
Improve the use and management of soil and water – critical inputs to commercial vegetable production	Achieved
Increase use of advanced technologies to improve farm productivity and/or cut input costs for growers	Achieved

KPI callouts:

- Techniques enabling the production of value-added foods, beverages and nutraceuticals were explored through the investment *Creating value from Edible vegetable waste* (VG15076). The project team successfully transformed fresh broccoli and carrot into shelf-stable, safe, nutritious, functional ingredients and products, including broccoli and carrot powders. The new technology developed is now available for industry uptake.
- The investments *Investigating novel glass technologies and photovoltaic in protected cropping* (VG15038) and *Research and operations to trial innovative glass and photovoltaic technologies in protected cropping* (VG16070) collaborated to study the use of smart glass as a way of providing better heat insulation to reduce temperature control costs.
- Grower training was the focus of the project *Facilitating adoption of IPM through a participatory approach with local advisors and industry* (VG15034 and VG15035) in which 52 infield training sessions were conducted in South Australia, supporting a grower trial of IPM as a key component in vegetable growing. Field brassica and head lettuce production under IPM management increased from zero to 70% and to 80% respectively in South Australia through this investment.

- The investment *Review of the national biosecurity plan for the vegetable industry* (VG15065) provided the industry with an updated biosecurity plan, which was reviewed annually through the project. The revised plan identifies the current highest-risk pests to the industry, the risk mitigation activities needed to reduce the biosecurity threat, and the surveillance and diagnostic activities and capabilities available.
- The project *Innovative solutions for management of tospoviruses of vegetable crops* (VG14063) identified genes and regulatory pathways involved in resistance to tospoviruses. The work is set to be highly beneficial on which to build future horticultural breeding programs.
- *EnviroVeg* (VG12008 and VG16063) is the vegetable industry's environmental best management practice (BMP) program. It involves a range of resources and services so that growers can benchmark and improve their BMPs and showcase their environmental credentials through certification. As of August 2021, there are 322 vegetable properties registered with the EnviroVeg program, of these, 140 vegetable properties encompassing 19,500 hectares have undertaken the self-assessment, or first phase of the program.
- The increased use of advanced technology was supported in *Adoption of precision systems technology in vegetable production* (VG16009) through the establishment of case-study farms in each state for research and extension, including training events and field days. The project significantly increased knowledge and awareness of how precision agriculture (PA) approaches can be applied to vegetable systems with 90% of project participants stating they will continue to use PA systems.

Case study: Soil condition management – extension and capacity building (VG13076) and Soil wealth and integrated crop protection – Phase 2 (VG16078)

Healthy, productive soils are a fundamental input into vegetable production, the health of soils on farms was the focus of the soil wealth and integrated crop protection projects.

Soil condition management – extension and capacity building (VG13076) ran between 2014 and 2017, helping vegetable growers use relevant soil management tools and resources on their farms. The core of the project was development of a national network of 14 demonstration commercial farms, five of which were focused on soil management. These sites provided opportunities for growers and advisers to learn first-hand how different soil practices could be implemented on commercial farms, through a series of farm walks, field days and masterclasses.

The results achieved on the demonstration farms formed the basis of a suite of resources for growers including case studies; some 20 fact sheets on soil, nutrition and compost; videos; webinars and a website to house them, www.soilwealth.com.au. Soil Wealth, together with the Integrated Crop Protection project, connected with more than 1,900 growers and industry people over the three-year period. More than 1,000 people attended farm walks at demonstration sites, 150 attended workshops, 80 attended in-depth masterclasses and 320 attended webinars.

Evaluation showed that growers and advisers made strong knowledge gains in the soil management areas of cover crops, compost, precision farming and soil biology. The project also reconnected the vegetable industry to Australian and global soil research. A strength of the project was taking research-proven principles and, working with the vegetable industry, making them into practical on-farm management actions.

The Soil Wealth project remains ongoing in its second phase (VG16078), providing producers with the latest information in soil and pest related areas.

Outcome 4: Supply chain – Increased supply chain integration and development through improved supply chain management, development of collaborative models and partnerships

The vegetable SIP 2017-2021 recognised that collaborative post-farmgate operations across supply chains are important to ensure that vegetable growers can coordinate their operations to get product to market.

Summary of strategic area and achievement status:

The strategies in the SIP that were identified to support vegetable supply chains are listed below. An achievement status is provided based upon internal evaluation of project performances:

Strategic area	Status
Improve supply chain integration and efficiencies	Achieved
Improve the product quality along the supply chain with the aim to increase returns for growers	Not achieved
Support collaboration between growers and stakeholders along the supply chain to improve its efficiency	Not achieved

KPI callouts:

- The investment *Identifying and sharing postharvest best practice on-farm and online* (VG13083) compiled and communicated the latest in postharvest technology for vegetables. This information was compiled into a series of extension materials, such as fact sheets, websites as well as 12 workshops. Additionally, the project enabled the production and distribution of over 1,400 postharvest handbooks, *Postharvest management of vegetables; Australian supply chain handbook*, which communicated new data on storage and handling through the supply chain for 10 vegetable products. The project attracted positive feedback at field days and meeting, and further positive reception to extension efforts such as workshops and road shows.
- The investment *Vegetable market price reporting pilot program* (Reporting (VG16084) and Market data (VG16081)) piloted the delivery of daily and monthly wholesale price reports for 10 major vegetable products that enabled comparison across markets, seasons and product forms. Over 2,000 unique users accessed the material over the 12 months it was available which supported more informed production and marketing decisions.
- An independent economic analysis for this investment (through the multi-fund investment *Ex-post impact assessment* (MT18011) resulted in a benefit cost ratio of 2.19 on account of improved market decisions when marketing product.

Outcome 5: Industry capability – Improved capability of levy payers to adopt improved practices and new innovation through improved communication and extension programs, grower innovation support, professional development and workforce building programs, and through improved farm management and information systems

The vegetable SIP 2017-2021 noted that given the significant investment in R&D and innovation in the sector, growers needed to have efficient mechanisms for identifying and harnessing innovations for their operations.

Summary of strategic area and achievement status:

The strategies in the SIP that were identified to support the capabilities of the vegetable industry are listed below. An achievement status is provided based upon internal evaluation of project performances:

Strategic area	Status
Improve communication and extension of research outputs to address a geographically and culturally diverse vegetable industry	Achieved
Support innovations that advance and grow the vegetable industry	Achieved
Improve grower skills in all areas associated with commercial vegetable production	Achieved
Improve farm management practices and systems to help growers in efficient and effective decision making	Achieved
Build skills in the vegetable industry workforce and attract new people to the industry	In progress

KPI callouts:

- Communication to increase awareness and knowledge of research outputs and developments in the vegetable industry was achieved through the projects *Vegetable industry communications program 2016-2019* (VG15027) and *National vegetable industry communications program* (VG18000). From the VG15027 project, a survey of growers revealed that 43% had implemented outputs from research programs on account of receiving them through communications material.
- Multiple programs to improve grower skills and develop industry professionals have been undertaken, including *Training growers in direct consumer engagement* (VG16035), *Leadership development program* (MT18016), *Growing leaders* (VG15030), *Facilitating adoption of IPM through a participatory approach with local advisors and industry* (VG15034 and VG15035), and *Vegetable industry education and training initiative* (VG15028).
- The project *Vegetable business benchmarking pilot in Western Australia* (VG17000) was a successful initiative to implement improvements in farm information management systems to drive investment and decision-making. Participants increased their return on capital by 4.97%, operating profit/ha by \$1,431 and operating efficiency (costs/income) by 0.65% over the three years of the program
- Industry skills were the focus of the investment *VegPro education and training initiative* (VG15028), in which 47 events were held to provide targeted training programs aimed at effectively upskilling people at all levels in the vegetable industry.

Case study: Vegetable National Extension Network (VG15040-VG15049)

The National Vegetable Extension Network (VegNET) was established in 2016, and formed 10 regional extension networks to keep growers informed about R&D activities, results and resources to support the adoption of industry best practice.

The first iteration of the VegNET program ran for three years, supporting the positions of Industry Development Officers (IDOs) in key vegetable growing regions that were responsible for the delivery of specialised events and distribution of R&D materials in those areas. Demonstration sites, mentoring and training and advisory groups were all used as ways of supporting grower engagement.

In a 2019 survey of stakeholders, VegNET was rated as “important” or “very important” by 88% of respondents as keeping them informed about R&D developments. Significant industry practice change was achieved, with 71% of vegetable stakeholders involved in the program making changes to practices or adopting new technologies as a result of the project, and 72% planning further changes.

The VegNET program was continued in a second phase of the program (VG19008 to VG19017). Under this phase Industry Development Officers (IDOs) in key vegetable-growing regions worked to develop and execute regional extension plans. Project activities included, identifying each region’s key priority issues and key regional resources, ensuring growers received assistance and information that met their needs, and assisting growers operate more efficiently and run profitable businesses.