Hort Innovation

Final Report

VegNET SA

Project leader:

Jordan Brooke-Barnett

Delivery partner:

South Australian Growers Ltd (t/a AUSVEG SA)

Project code:

VG15045

Project:

VegNET SA – VG15045

Disclaimer:

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Content

Summary

The contents of this report outline the achievements of the project, VegNET SA, (VG15045) from July 2016 – April 2019. Delivery of this project was conducted by the South Australian Industry Development Officer at AUSVEG SA, Hannah McArdle with oversight and management from Jordan Brooke-Barnett, AUSVEG SA CEO and support from the association Board of Directors. At the beginning of Year 3 of the project a variation was introduced. Starting in March 2018, two Vietnamese Extension officers were recruited. The officers each worked two days a week and carried out a number of activities to help with connecting Vietnamese speaking growers in the region to other industry stakeholders for their mutual benefit. Growers were provided important information on updating framing techniques and networking with researchers, agronomists and Government officials to improve their businesses. As such, the VegNET SA project has achieved a strong reputation and grounding with both English and Vietnamese speaking vegetable growers in South Australia.

AUSVEG SA has engaged with many vegetable growers and grower groups across South Australia and researchers intrastate and interstate. Communication with all of these stakeholders was an ongoing process throughout the entire project. As relationship building with stakeholders was a crucial part of the success of this project, a significant number of growers were visited in the 3 year project. Communication methods included bi-monthly newsletters, social media, phone calls and face-to-face meetings.

This project was delivered in SA along with 9 other similar projects delivered nationally on a correspondging timeframe. The aim of this project was to increase capacity for South Australian Vegetable businesses. This was achieved through:

- Workshops
- Newsletter Articles
- Face to face meetings
- Industry Events
- Media Releases
- Case Studies
- Social Media

This report also discusses key outcomes. Case studies were used to report successful outcomes of the project. An example of this was a successful outcome for a grower who attended a Post-Harvest Workshop event and created a new storage bin for their produce and saw a reduction in rejections from buyers.

This report also discusses reccomendations for similar work and projects into the future.

Keywords

AUSVEG SA - The statewide industry association representing South Australia's $700 million vegetable industry. AUSVEG SA were a partner in this project assisting to engage with growers and advisors.

VegNET SA – The South Australian component of the national VegNET program which provided extension support for growers to better access and understand Research and Development outcomes from the National Vegetable Levy.

Hort Innovation - Hort Innovation is the grower-owned body responsible for investment of the National Vegetable Levy and funded the VegNET SA project.

R&D - Research and Development funded through Hort Innovation and the National Vegetable

VegPro – The VegPro project was implemented as a separate project and ran concurrently with this project for part of its delivery cycle. The VegPro project developed a large volume of workshops which were delivered by VegNET SA as part of this project.

Introduction

This project was delivered by AUSVEG SA with the aim of increasing R&D extension and capacity building activities for South Australian Vegetable Farms. This project was developed due to an obvious gap within research, development and extension within South Australian vegetable businesses and part of a larger National project coordinated by Applied Horticulture Research with a total of 10 projects across Australia which ran similar to VG15045. The project delivered a large volume of R&D extension activities throughout its duration and was effective in coordinating industry feedback in terms of what research and development should be communicated to the South Australian growers.

A team of VegNET SA Industry Development Officers delivered the communication material in this project to growers and growing businesses, Government and industry people. All events were free of charge to levy-paying vegetable businesses. Employed full time for this project was Hannah McArdle, whom began employment in July 2016 as Industry Development Officer (IDO) with AUSVEG SA. In March 2018, a further two staff were employed under a variation of contract negotiated with Hort Innovation. Thang Hoang Le (Kevin) and Tinh Lai (Tim) were employed as Vietnamese Extension Officers to improve outreach and extension activities within the Vietnames communities. Both Kevin and Tim worked 2 days per week, and since their employment began on 8 March 2018 both extension officers held many meetings with growers and industry members including the Vietnamese Farmers Association, Young Growers Group, PIRSA, NRM local and interstate agronomists. The Key Perfomance Indicator's for the VEO's and IDO were managed by the VegNET SA IDO.

The rationale of this project was to increase capacity for South Australian Vegetable businesses. This was completed by improving and increasing uptake of the latest and most relevant research and development within the state. The idea for this project was to encourage growers to introduce practice change and share the successful outcomes for other growers to then implement these changes. The 5 case studies within this project are examples of how improving the communication of industry R&D and delivering quality workshops and opportunities to interact with researchers has led to strong results with growers (see **Appendices**).

In addition to general extension activities, the project devoted resources to build capacity within the Vietnamese speaking grower community located on the Northern Adelaide Plains. Vietnamese Extension Officers Tim and Kevin focused on the key strategic areas of building biosecurity capability and food safety capacity building activities in addition to more general extension activities directed at non-english speaking growers.

The succesful outcomes of this project ensure that a positive legacy will remain in South Australia and interstate. This project demonstrates how to ensure an extension focused levy funded project should be conducted with South Australian Vegetable growers.

Methodology

The project was developed and delivered using the methodology below which was developed and proposed by AUSVEG SA. This project focused on delivery the most relevant and useful R&D to the South Australian vegetable growers. Through feedback from growers, it was established that there were 6 ways to best engage the industry and others alike to communicate the R&D. These include:

1. Grower visits
2. Workshops
3. Increasing grower list
4. Newsletter articles
5. Fact Sheets
6. Case Studies

Extension officers approaching growers in the region by carrying out farm visits gathering what they are in need of as well as their difficulties. Their issues were recorded into a database and the SA Industry Development Officer worked with businesses to solve R&D problems and receive feedback into the program of events. A list of successful case studies can be found in the **Appendices**.

As well as general extension activities and grower outreach, the Vietnamese Extension officers also conducted activities in the two key areas as outlined in the project contract. There was a focus placed on building quality assurance capability and getting Vietnamese growers to achieve chemical certifications and QA accreditation. The Vietnamese Extension officers were vital to engaging with the Vietnamese growing community to organize Vietnamese Freshcare training to be delivered as part of this project and in encouraging Vietnamese growers to attend ChemCert training offered through VegPro and translating for non-english speaking growers. The other key area of focus was building capacity in Biosecurity and the two Vietnamese Extension Officers became important ambassadors in the region, handing out Biosecurity signs and working with Biosecurity SA staff to improve incursion preparedness. During the course of this project, AUSVEG SA and Biosecurity SA developed a 'Clean Your Farm' campaign which developed materials for growers (footbaths, hand shear holders and dust masks) as well as information materials to promote better farm level biosecurity practices. The Vietnamese Extension Officers were instrumental in working to educate growers on better biosecurity practices such as worker and equipment hygiene between properties as well as distributing campaign materials and collateral such as biosecurity signs.

On farm information gathering assisted to identify priority issues for workshops and other R&D activities. Throughout the project, AUSVEG SA aimed to link growers to R&D extension opportunities which met major needs in the region. Through this process, AUSVEG SA was able to deliver a strong programme of communications and workshops across a broad range of topics of industry need. In addition, we were able to raise awareness of Hort Innovation and key projects funded by the National Vegetable Levy.

Throughout this project AUSVEG SA delivered a broad range of activities. Workshops, facts sheets, newsletter and emails were sent to growers addressing key issues of need.

Key activities

1. Grower visits were the most conducted communication method throughout this project. This proved to be the most useful tool to deliver information in a private setting and receive a positive outcome.
2. Workshops were the second most used form of communication to share information with the industry. This was the most efficient tool to share information as multiple growers could be in the same location at one time. This allowed for maximum information transfer however, it proved that the right time and location were crucial to get right due to geographical isolation of growers across the state.
3. For the reason of increasing the information share within the state, increasing the target audience number was crucial. This was achieved by meeting new growers and industry people and thus, the grower list of growers engaged with VegNET SA was increased during this project.

4. Updates of the latest R&D were summarized and shared in the AUSVEG SA Newsletter to allow readers to learn more about Hort Innovation funded projects. The target audience for these articles was the AUSVEG SA Members.
5. Over the course of this project, 3 fact sheets were released. Specific topics for the fact sheets were, Biosecurity, Minor Use (Chemical) and the Horticulture Code of Conduct. The fact sheets were distributed to AUSVEG SA members and other industry people through email and face to face meetings. The Horticulture Code of Conduct Fact sheet was also translated into Vietnamese by one of two Vietnamese Extension officers. This was to increase awareness and understanding of the Hort Code and the VegNET – SA project.
6. Case studies were developed as a tool to measure the success of the uptake of R&D and/or practice change throughout the project (see **Appendices**). The case studies in this project include topics on export, post-harvest management and soil and worm management. Case studies were important to showcase how uptake of levy-funded R&D was achieved throughout the delivery of this project.

A further outline of key deliverables and communication materials are included in the Outputs section below, as well as copies of all major outputs as **Appendices** to this report.

Outputs

The following section outlines key outputs throughout this three year project.

Key outputs

Each year, AUSVEG SA set annual Key Performance Indicators (KPI's) which were negotiated with Hort Innovation. Specific delivery of annual KPI's in included in detail in Milestone Reports throughout the project which outlined performance against these deliverables.

A summary of total project outputs is included below for the full three years of this project.

Since the beginning of this project in 2016, a total of 236 grower visits have been conducted, 21 workshops have been held, 24 articles have been published in the AUSVEG SA Newsletter, 3 fact sheets have been create and 5 case studies have been completed.

The table below See table below for overall project KPI's and progress recorded. In addition, the Monitoring and Evaluation Plan for the project can be found at **Appendix 5.**

Activity	When	How	KPI/Target	Progress
1. Grower Visits	July 7 2016 – April 19 2019	Survey growers to assess demand for extension	**IDO:** Approximately 200 visits to growers will be aimed for throughout the project	**Complete (201 visits conducted)**
			VEO: Approximately 25 Vietnamese grower visits and 10 LOTE grower visits will be aimed for throughout the project	**Complete (35 visits conducted)**
2. Workshops	July 7 2016 – April 19 2019	Workshops on various topics suggested by growers with feedback forms including questions on event satisfaction	**IDO:** 12 workshops/seminars will be aimed for throughout the project	**Complete (20 Workshops held)**
			VEO: 1 workshop/seminar delivered throughout the project.	**Complete (3 workshops held)**

				(2 workshops held jointly with IDO)
3. Increasing grower list	July 7 2016 – April 19 2019	Visiting growers at locations such as the Produce markets	**IDO:** Finding 6 growers outside of current AUSVEG SA data list will be aimed for per year	**Complete**
			VEO: Finding 2 growers outside of current AUSVEG SA data list will be aimed for per year	**Complete**
4. Newsletter articles of the latest R&D or any updates from Hort Innovation	July 7 2016 – April 19 2019	Articles released in the AUSVEG SA newsletter of summaries of the latest R&D	**IDO:** A newsletter article (18 in total) in each AUSVEG SA Bi-monthly newsletter is aimed for per year	**Complete** **(19 articles produced)**
			VEO: A translated newsletter article (4 in total) in each AUSVEG SA Bi-monthly newsletter is aimed for per year	**Complete** **(5 articles translated or produced)**
5. Fact Sheet	July 7 2016 – April 19 2019		**IDO:** 3 fact sheets on a relevant issue to be produced and distributed to SA Vegetable growers and throughout the VegNET team	**Complete** **(3 Fact sheets produced)**
			VEO: One translated fact sheet on a relevant issue to be produced and distributed to SA Vegetable growers and throughout the VegNET team	**Complete**
6. Case studies/narratives	July 7 2016 – April 19 2019	Contacting growers post-workshops/events to question any new changes	**IDO:** 4 Case Studies/narratives for outcomes of any R&D activity	**Complete**
			VEO: One Case Study/narrative for outcomes of any R&D activity	**Complete**

Grower Visits

A large number of grower visits were conducted during this project to a broad range of regions such as the Northern Adelaide Plains, the Adelaide Hills and Murraylands, South East and Riverland by the South Australian Industry Development Officer. These visits were a regular occurrence and the most effective way

to communicate with the growers in SA. AUSVEG SA encouraged the Industry Development Officer to spend regular time out with industry as a means to informing the VegNET SA workshop programme and to identify issues requiring R&D support. In addition, throughout the project VegNET SA staff regularly supported Hort Innovation and R&D providers to visit South Australia and took them out to see key growers. The on-farm component of the VegNET SA project was a very important and productive activity to ensure growers were involved in the program.

Increasing grower list

Over the course of this project, the total grower list for VegNET SA increased by approximately 40 new growers. Extension officers began visiting growers and following leads at the beginning to establish networks and build relationships with existing and new growers mainly focusing on young growers and Vietnamese growers in the Northern Adelaide plains. Increasing grower engagement is a strong indication of the quality of the program and VegNET SA were able to engage a strong cohort of new growers throughout the Project. Due to the sensitivity of the information, the names and contact details are not within this document.

Workshops

Over the course of the project a total of 21 workshops were held in South Australia. Workshop topics were organized according to feedback and requests from grower's within South Australia. A list of workshops is provided below.

AUSVEG SA increased the number of workshops held towards the end of the program due to grower demand and increased engagement with the VegNET SA program. Many of the workshops were developed and delivered through other levy projects with VegNET SA facilitating workshops for them in SA and promoting the event and managing event logistics and attendance. This worked well, as it meant that VegNET SA could deliver a high volume of capacity building opportunities for SA vegetable growers and increase the visibility and impact of the program.

A list of the workshops delivered throughout the project is included below. Individual workshops are covered in more details in the Milestone Reports which accompany this report.

	WORKSHOP NAME	DATE	LOCATION	TOPICS	PRESENTERS	NUMBER OF ATTENDEES
1	Soil Borne Disease	18/10/16	Thorndon Park Produce	Soil Flood Recovery	Doris Blaesing	20+
2	Soil Borne Disease	18/10/16	Adelaide Hills	Soil Borne Disease management	Doris Blaesing	5+
3	Dutch Technologies	1/11/2016	Mawson Lakes Technology Park	Dutch Greenhouse Technologies	Jordan Brooke-Barnett Bert-Jan Nolden	38
4	Consumer Alignment	18/11/2016	AE Cranwell & Sons	Statistical sales for specific vegetables for previous year	Nielsen Data	6
5	Consumer Alignment	18/11/2016	South Australian Produce Market	Statistical sales for specific vegetables for previous year	Nielsen Data	2
6	Weed Management	23/5/2017	Eastbrook Farms	Planning for upcoming weed project	Chris Fyfe	7
7	Weed Management	24/5/2017	Thorndon Park Produce	Planning for upcoming weed project	Chris Fyfe	5
8	CGMMV	23/6/2017	Virginia Horticulture Centre	Management and Identification of CGMMV	Jessica Lye Denis Persley	23
9	TPP	19/7/2017	Virginia Horticulture Centre	Management and Identification of TPP	Callum Fletcher Raylea Rowbottom Christina Cook	40
10	Post-Harvest Management	1/8/2017	AE Cranwell & Sons	Most efficient post-harvest produce management	Jenny Eckman Adam Goldwater	10
11	Post-Harvest Management	2/8/2017	Thorndon Park Produce	Most efficient post-harvest produce management	Jenny Eckman Adam Goldwater	15
12	Negotiations & Influencing	19/2/2018 – 20/2/2018	South Australian Produce Market	Teaching negotiation tips and tricks	Russel Bail Tony Hudson	15
13	Chemical Handling	6/3/2018 – 7/3/2018	South Australian Produce Market	Accreditation course for chemical use	Stephen Duff	15
14	Export For Beginners	22/3/2018	South Australian Produce Market	Basic skills in export	Export Council of Australia	10
15	Irrigation	17/5/2018	Thorndon Park Produce	Basic skills course in	Kelvin Montague	15

				irrigation	Adam Harber	
16	Vietnamese Agronomy (Organised by IDO and VEO's)	12/6/2018	Virginia Hotel	Basic agronomy practices	Dean Izzard	33
17	Chemical Handling	24/7/2018 – 25/7/2018	Mount Barker House	Accreditation course for chemical use	Stephen Duff	10
18	Veg Innovations	9/8/2018	Mawson Lakes Technology Park	Value adding in vegetable businesses	Hazel McTavish-West	30
19	Freshcare for Vietnamese (Organised by VEO's)	4/10/2018	LVE Produce	Freshcare accreditation course	Adrienne Galloway	9
20	Consumer Alignment + EnviroVeg	8/12/2018	South Australian Produce Market	Statistical sales for specific vegetables for previous year	Melanie Norris Andy Shaw Sam Turner	10
21	Worm Activity in Soil (Organised by IDO and VEO's)	26/11/2018	LVE Produce	Encouraging worm activity in soil and identifying worm species	Bill Grant	26

Newsletter articles

A total of 24 newsletter articles were released in the course of the project. Of 24, 19 were in English and 5 were translated into Vietnamese. See table below for a list of articles.

Number	Newsletter	Name of Article	Release Date	Appendices
1	AUSVEG SA Newsletter	"*Introduction of Industry Development Officer*"	August 2016	1.1
2	AUSVEG SA Newsletter	*"Summary of the latest consumer research from Project Harvest"*	August 2016	1.2
3	AUSVEG SA Newsletter	*"Vegetable Industry Education & Training Gap Analysis"*	December 2016	1.3
4	AUSVEG SA Newsletter	"*Optimum Vegetable Portion Size to Meet Consumer Needs*"	December 2016	1.4
5	AUSVEG SA Newsletter	*"Pre-harvest practices that will increase the shelf life of vegetables"*	March 2017	1.5
6	AUSVEG SA Newsletter	*"Benchmarking Australian regulation against our international competitors"*	March 2017	1.6
7	AUSVEG SA Newsletter	*"Improving the management of insect contaminants in processed leafy vegetables*"	May 2017	1.7
8	AUSVEG SA Newsletter	*"Market research into vegetable snacking options*	July 2017	1.8

9	AUSVEG SA Newsletter	*"Integrating sustainable soil health practices into a commercial vegetable farming operation"*	July 2017	1.9
10	AUSVEG SA Newsletter	*"Opportunity to provide feedback to Vegetable Industry Strategic Investment Plan"*	September 2017	1.10
11	AUSVEG SA Newsletter	*"Preserving peak freshness of Broccoli"*	September 2017	1.11
12	AUSVEG SA Newsletter	*"Evaluation of automation and robotics innovations: developing next generation vegetable production systems*"	November 2017	1.12
13	AUSVEG SA Newsletter	*"VegWHS Training Resources"*	November 2017	1.13
14	AUSVEG SA Newsletter	*"Review of current irrigation technologies"*	February 2018	1.14
15	AUSVEG SA Newsletter	*"Management of insecticide resistance in the Green Peach Aphid"*	February 2018	1.15
16	AUSVEG SA Newsletter	*"*Market Opportunity for Vegetable Juices"	April 2018	1.16
17	AUSVEG SA Newsletter	*"*Improved skill for regional climate in the ACCESS-based POAMA model	April 2018	1.17
18	AUSVEG SA Newsletter	*"*On-farm evaluation of vegetable seed viability using non-destructive techniques*"*	July 2018	1.18
19	AUSVEG SA Newsletter	*"*Surveillance of tomato potato psyllid in the eastern states and South Australia*"*	September 2018	1.19
20	Vietnamese Extension Officer Visits	Vietnamese Translated version - *"VegWHS Training Resources"*	October 2018 – March 2019	1.1.1
21	Vietnamese Extension Officer Visits	Vietnamese Translated version - *"Preserving peak freshness of Broccoli"*	October 2018 – March 2019	1.1.2
22	Vietnamese Extension Officer Visits	Vietnamese Translated version - *"Evaluation of automation and robotics innovations: developing next generation vegetable production systems*"	October 2018 – March 2019	1.1.3
23	Vietnamese Extension Officer Visits	Vietnamese Translated version - *"Review of current irrigation technologies"*	October 2018 – March 2019	1.1.4
24	Vietnamese Extension Officer Visits	Vietnamese Translated version - *"Management of insecticide resistance in the Green Peach Aphid"*	October 2018 – March 2019	1.1.5

Fact Sheets

Over the project period, 3 fact sheets were created. All three fact sheets were created due to grower request of more information. Fact sheet 3, "Horticulture Code of Conduct" was also translated into Vietnamese and shared throughout the South Australian Vietnamese farming community. See table below for a list of fact sheets.

FACT SHEET	TITLE	RELEASE DATE	APPENDICES
1	Biosecurity *Summary of on-farm biosecurity practices and resources for better planning.*	January 2017	2.1
2	Minor Use *Summary of Australia's Minor Use program and key resources for growers.*	October 2017	2.2
3	Horticulture Code of Conduct *An explanation of the new Horticulture Code of Conduct and how this applies to growers.*	June 2018	2.3

Case Studies and Narratives

During the project 5 Case Studies and Narratives were developed to demonstrate how growers were accessing and using R&D resources. A copy of each document is included in the **Appendices** and a list of growers and topics included below for reference.

CASE STUDY/NARRATIVE	NAME	RELEASE DATE	TOPIC	APPENDICES
1	Chris Musolino	March 2018	Value Adding	(Case study only)3.1
2	Anthony De Ieso	March 2018	Post-Harvest Management	3.2
3	Anthony De Ieso	February 2019	Soil Preparation	3.3
4	Kevin Le	February 2019	Worm Activity	3.4
5	Daniel Hoffman	February 2019	Worm Activity	3.5

Outcomes

Project performance

- The project has established a strong base of engagement and respect with South Australian growers throughout the state. The ongoing communication with growers has led to building trusted relationships with each grower visited and the project has met all engagement KPI's for the first three years of the project.

Grower assistance

- AUSVEG SA has assisted a number of growers with the commercialisation of value-added products through the VegNET SA project. Examples include assistance provided to help a grower commercialise a value-added cauliflower rice product in a microwaveable bag, where we assisted to link the grower with food scientists and policy staff in the South Australian Government as well as commercial partners. The Australia-first product has now launched in Woolworths and sold over 15,000 units (see **Appendix 3.1**). AUSVEG SA has also worked with a large grower to link with researchers and R&D outputs to develop a similar microwaveable product in a separate category as well as promoted linkages for South Australian growers with assistance to explore value-added product opportunities.
- AUSVEG SA was able to put flood-affected growers in touch with Dr Doris Blaesing to advise on soil recovery after the recent Northern Adelaide Plains floods. Assistance was greatly appreciated by the growers who were able to return their land to production faster
- AUSVEG SA has connected growers with AUSVEG national and South Australian government export services and advice and assisted to manage the development of export markets for an innovative wrapped cauliflower product and a cauliflower rice product with two separate major growers in SA.
- A nitrogen use trial has been established in the Adelaide Hills region with the assistance of Dr Doris Blaesing of RMCG. The trial has the potential to ensure more targeted use of fertiliser in crops under production and has been developed in cooperation with the growers' agronomist from a prominent reseller.

Working with Vietnamese growers

- Through visits, the non-English speaking growers engaged more openly with industry and government. Growers get more insight into R&D within the industry. There is more emphasis on Biosecurity on farms and a more modern approach to farming practice.

Workshops and communications

- A broad range of workshops was held with strong attendance, feedback and support from growers. These outputs significantly increased the opportunities for growers to access industry R&D.
- Regular industry communications reinforced the VegNET SA brand and increased knowledge and understanding of National Vegetable Levy investments in South Australia.

International linkages

- AUSVEG SA has facilitated a high-level relationship with the Kingdom of the Netherlands which offers exciting opportunities to extend Dutch growing technology in South Australia. AUSVEG SA has used relationships forged during the Dutch inbound mission and technology workshop to progress further initiatives.

Strengthening relationships with government providers

- AUSVEG SA has strengthened relationships with the SA Government, in particular Biosecurity SA through communication on pest incursion in SA such as Tomato Potato Psyllid and Cucumber Green Mottle Mosaic Virus.

Ongoing legacy

- AUSVEG SA will work with Hort Innovation investors to ensure the legacy of the project and is open to working with any other groups who would like to implement similar projects.

Monitoring and Evaluation

At the beginning of this project, a Monitoring and Evaluation (M&E) Plan was established in the early stages and then continued throughout the entire period of the project. This M&E plan allowed for appropriate KPI's to be developed and reported on in Annual plans reported on in the regular project Milestone Reports. The Monitoring and Evaluation Plan can be found at **Appendix 5**. Furthermore, the supporting Case studies and narratives completed during this project provide 5 examples of successful outcomes of this project. As reported in the Outputs section, AUSVEG SA has met all KPI's set for the duration of this project and delivered a number of successful Case Studies demonstrating project success.

Feedback forms were also collected from most workshops where applicable. Note that the majority of these workshops were delivered through external levy projects or VegPro, VegNET SA collected information on behalf of researchers however these were collated separately by researchers and reported on as part of separate project reporting requirements.

AUSVEG SA did however collate and report on data for four of the workshops conducted as part of this project and the results are included below.

Please find below the event feedback data for the following workshops:

- Chemical Handling
- Export for Beginners
- Cucumber Green Mottle Mosaic Virus (CGMMV)
- Tomato Potato Psyllid (TPP)

VegPRO Chemical Handling course:
This workshop held on 6-7 March 2018 at the SA Produce Market. The course was accredited and was marketed on Eventbrite with all 15 tickets being claimed 2 weeks prior to the event. The event was run by Steven Duff from Duff Consulting.

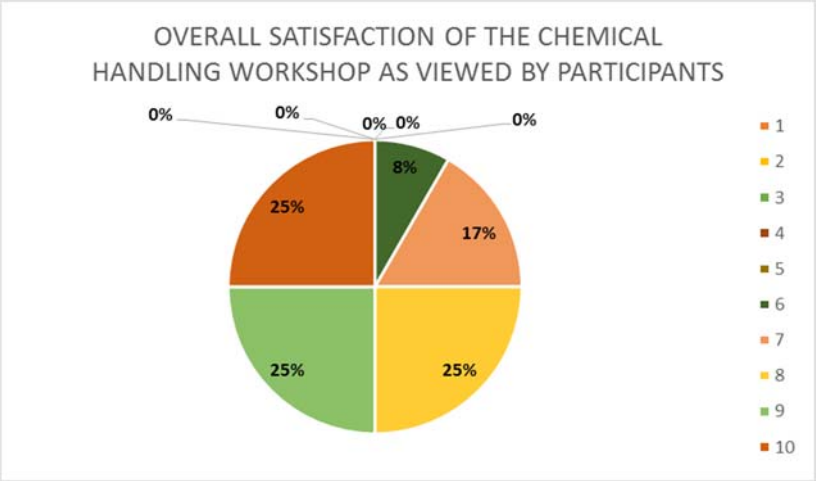

FIGURE 1: Pie chart demonstrating the satisfaction ratings (0-10) given by participants at the Chemical Handling workshop held in February. As seen above, 75% of participants rated the event 8 or higher.

Export for Beginners Workshop:

This workshop held on 22 March 2018 focussing on the basic principles and steps of exporting vegetables from Australia. This workshop reached capacity at 10 attendees and was run by Peter Mace from Export Council Australia and Michael Coote, Export manager at AUSVEG National. See below feedback of satisfaction ratings for the event.

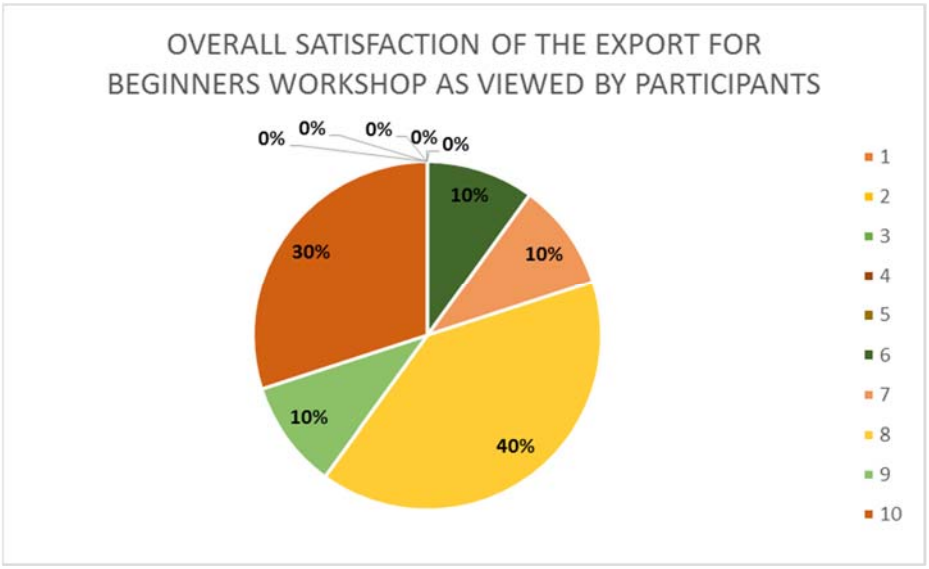

FIGURE 2: Pie chart demonstrating the satisfaction ratings (0-10) given by participants at the Export for Beginners workshop held in March. As seen above, 80% of participants rated the event 8 or higher.

This workshop held on 23 June 2017 focussing on the impact and identification of cucumber green mottle mosaic virus (CGMMV) in South Australia was organised by AUSVEG SA in collaboration with the South Australian Government, Department of Agriculture and Fisheries Queensland and presented by AUSVEG Biosecurity National Manager, Dr Jessica Lye.

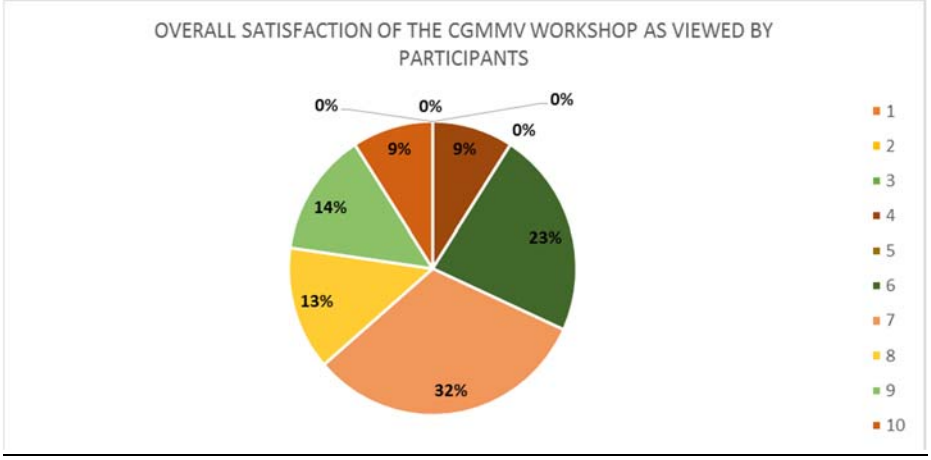

FIGURE 3: Pie chart demonstrating the satisfaction ratings given by participants of the CGMMV workshop. Participants were asked to give a rating from 1-10 (with 10 the highest and 1 the lowest) of satisfaction for the workshop. As seen above, 82% of 23 participants (of which 60% were growers) were satisfied with the event (>5 rating)

Tomato Potato Psyllid Workshop:

This workshop held on 19 July 2017 focussing on the impact and identification of Tomato Potato Psyllid (TPP) in South Australia was organised by AUSVEG SA in collaboration with the South Australian Government, University of Tasmania and presented by AUSVEG Biosecurity Coordinator, Callum Fletcher

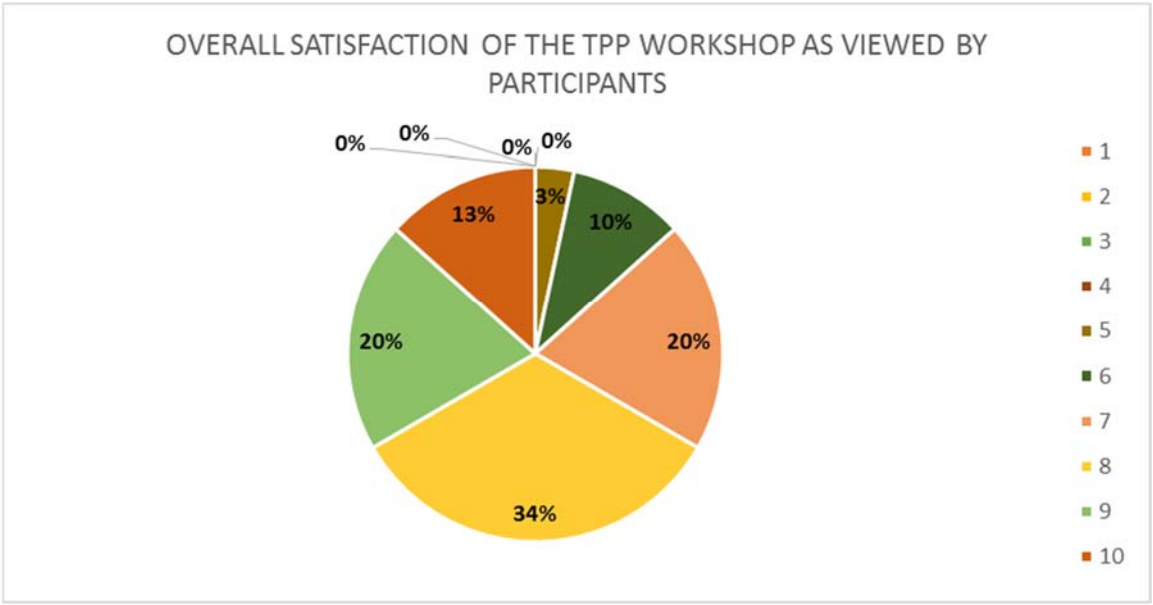

FIGURE 4: Pie chart demonstrating the satisfaction ratings given by participants of the TPP workshop. Participants were asked to give a rating from 1-10 (with 10 the highest and 1 the lowest) of satisfaction for the workshop. As seen above, 97% of the 30 participants (of which 31% were growers) were satisfied with the event (>5 rating).

Project Effectiveness

This project has achieved all required tasks with all set KPI's achieved.

Project Relevance

This project was highly relevant to the needs of the South Australian Vegetable growers. The project was constantly being re-assessed by the Industry Development Officer through feedback from growers, industry members and other VegNET projects interstate.

Project Process appropriateness

Almost all AUSVEG SA Growers members were involved in the project at some point over the length of the project, although level of engagement varied. Grower feedback was highly regarded within this project in regards to information delivery. Verbal conversations occurred regularly in terms of what most appropriate and convenient for grower engagement. These conversations happened with growers and other industry people. An example of this is when the Industry Development Officer questioned growers on what they thought of webinars, it was noted that webinars are not appropriate with this project. Due to this feedback, webinars were not conducted in this project.

Project Efficiency

The project made many attempts at improving project efficiency. During the project lifespan, as an attempt to improve project efficiency and increasing target audience, AUSVEG SA moved office location from the South Australian CBD to the South Australian Produce Market. This proved to be successful as project engagement and awareness increased.

Recommendations

The first iteration of the VegNET SA project was highly successful in engaging South Australian growers and promoting relevant industry R&D outcomes.

From AUSVEG SA's experience with the initial project, we present the following recommendations:

- On farm visits are critical to building trust and understanding with growers and therefore should be a focus of future R&D extension activities. Sometimes R&D providers look to ways to rationalize expenses through use of technology (i.e podcasts, webinars), but in AUSVEG SA's opinion good old fashioned farm visits are critical.
- Workshops on farm are a powerful way of communicating to multiple growers, with AUSVEG SA achieving strong engagement for events throughout the project. These events, however, need to be tailored to grower interest. The only issues with grower attendance arose when a levy-funded research project wanted to present on an issue where there was little value placed on it by growers. An example would be the Nielsen events where it was hard to find growers interested in broad market data. This information, while valuable, is better delivered to large growers individually or used for industry wide strategic planning purposes rather than a workshop for all growers.
- It is important to segment the growers by region, crops grown or other factors to target workshops and R&D materials to their needs. The VegNET SA project needs to be tailored to the diverse needs of growers throughout the state to ensure that content is engaging and deals with pressing issues for the growers.
- AUSVEG SA welcome Hort Innovation staff and researchers to travel and meet growers with us as much as possible. It is great for the growers to have a relationship with key account managers and researchers and we are always happy to facilitate this.
- AUSVEG SA was able to achieve efficiencies in our operations by engaging with a number of grower groups and advisors working in industry. We recommend this approach as a quick way to canvass ideas with a number of growers at once and determine the content for communications, R&D assistance and workshops.
- It is essential for the VegNET Industry Development Officer to be part of the industry and attend as many regional meetings and social opportunities as possible. Once the industry gets to know the IDO the process of connecting with more growers through referals is easier. As the project reached its conclusion in SA, growers were actively calling the IDO and raising issues and using them as a resource.

Refereed scientific publications

None to report.

References

None to report.

Intellectual property, commercialisation and confidentiality

None to report.

Acknowledgements

None to report.

Appendices

Appendix 1: Newsletter Articles

Article 1: **Introducing SA's new Industry Development Officer**

AUSVEG SA would like to welcome our new Industry Development Officer Hannah McArdle to our team. Hannah will work closely with SA growers throughout the state to communicate and apply National Vegetable Levy research as part of the National Vegetable Extension Network project funded by Hort Innovation Australia.

Dear SA growers,

I am extremely pleased to introduce myself to you all as the new Industry Development Officer for AUSVEG SA.

As some background, I grew up on a small sheep property near Naracoorte in the South East of SA, and attended Naracoorte North Primary School. In 2008, my family moved to the Adelaide Plains region where I commenced high school in Balaklava and played netball for Long Plains netball club. I worked at the local pub on weekends before moving to the city in 2013 to begin my university studies.

I completed a Bachelor of Agricultural Science at the University of Adelaide with extra studies in horticulture at the University of New England in Armidale in November 2015. Immediately after completing my degree I was employed with Coles as a Quality Inspector in fresh produce at the Burton distribution centre, before commencing work with AUSVEG SA.

I have already met a number of you since I started on 6 July. I intend to reward the trust you have in AUSVEG SA by providing a focus on communicating past and present research and development for the benefit of local industry. My role in particular is to find issues and knowledge gaps within the horticulture industry and fill them in by regular communication with growers, members and researchers. I will also be holding workshops and field days with experts in the particular fields throughout the year with prospects of one being held in late September on soil borne diseases, as well as another workshop in the following months.

If you have any questions in regards to R&D or suggestions for workshops or field days, or simply would like to say 'Hi' please don't hesitate to call me as I am here to help. I will be visiting members regularly across the state, so hopefully I can meet you all at some point. I am looking forward to my career with AUSVEG SA.

Hannah McArdle
Industry Development Officer
AUSVEG SA
0408 475 995
hannah.mcardle@ausveg.com.au

This project has been made possible by funding from Horticulture Innovation Australia using the National Vegetable Levy and funds from the Australian Government

Article 2: **Latest Consumer Research from Project Harvest**

In this Vegetable Extension Network feature, SA Industry Development Officer Hannah McArdle presents key findings from the latest levy-funded consumer research conducted as part of Project Harvest.

2016 is well over halfway and the year's consumer trends have emerged. While 2015 was the year of Nutella and American-style burgers, 2016 seems to be a healthier approach and could see consumers shed a few kilos with an increased focus on health food options and environmental awareness.

What trends should growers be aware of?

Superfoods
Superfoods are not a new trend, but popularity is increasing. They are being sold in more readily available packages and continuing to sell for a consumer price premium (e.g. Kiwi fruits and chia seeds).

Continuation of provenance, seasonality and knowledge
Consumers are moving away from overly processed and artificially sweetened foods and are looking for produce which they have more knowledge about. Knowing where food is from and knowing whether it is in season are key indicators of freshness for consumers which are also more likely to purchase locally grown produce.

Natural and Organic
Some experts are going to the extremity that vegetables are expected to push animal protein to the side as a side dish due to the increase of meat prices and health associated concerns. Consumers are learning more about organically grown vegetables and are looking for this produce.

Raw
There is growth in the number of consumers that prefer to eat foods in their most natural state and therefore opt for raw foods. Putting the health connotations aside, raw food also offers up different flavour and texture sensations, providing the variety many crave (e.g. Botanical cuisine raw sauces).

The Market Place
Markets are becoming an increasingly popular location to purchase fresh produce. Consumers are now more often shopping in markets among the hustle and bustle with hopes to buy fresher produce for lesser prices.

Implications for growers:

There are opportunities for growers to bring nutrient rich food varieties to market in Australia and work with experts such as nutritionists to better communicate health benefits of different produce.

The trend toward raw food offers opportunities for growth in convenience and fresh cut products.

The continued growth in farmers markets are challenging traditional distribution models and may offer opportunities outside of the major supermarkets.

Further information: For further information on the Vegetable Extension Network or this project contact South Australian Industry Development Officer Hannah McArdle on 0408 475 995 or hannah.mcardle@ausveg.com.au.

This project has been made possible by funding from Horticulture Innovation Australia using the National Vegetable Levy and funds from the Australian Government.

Article 3: **R&D Spotlight: Vegetable Industry Education & Training Gap Analysis (VG14061)**

Latest National Vegetable Levy funded research of interest to South Australian growers.

This project, currently being delivered as *VegPRO*, presents a gap analysis of education and training for the Australian vegetable industry. The study included a review of education and training on profitability. An evaluation of previous studies were conducted as part of this project to identify possible future strategic gaps which enabled the research to complete the gap analysis and make suggestions for the delivery of future training. The full report (accessible on AUSVEG Infoveg website) provides detail of the outputs and outcomes as well as a comprehensive synthesis and recommendations to Hort Innovation Australia.

The project identified that training has to be tailored to the needs of specific groupings in the industry rather than a general approach to all groups. It was also identified that a successful training initiative has to take a so called "producer-driven" approach. The project discovered that to essentially provide the most appropriate training that industry persons propose what training and education they require through proposals which specifically target their needs.

VegPRO is also currently looking for training providers that can design and deliver training. *VegPRO* aims to fill gaps in existing services and also let you know where relevant training is already available. *VegPRO* is free for vegetable levy payers; but training will also be available to others in the industry; packers, processors, wholesalers, retailers, logistics and service providers.

Vegetable growers or groups can also encourage a training provider to register, submit an idea or lodge a full application to provide training that meets your needs. If you have a training idea, contact Sophie or Doris (details below) or go onto the *VegPRO* website http://www.vegpro.com.au/ and lodge a feedback form.

Further information:

Sophie Lapsley
Education and Training Coordinator
0426 200 996

Doris Blaesing
0438 546 487

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VegPRO
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This project has been made possible by funding from Horticulture Innovation Australia using the National Vegetable Levy and funds from the Australian Government.

Article 4**: R&D Spotlight: Optimum Vegetable Portion Size to Meet Consumer Needs (VG12094)**

Latest National Vegetable Levy funded research of interest to South Australian growers.

For the fear of wasting vegetables, consumers are buying fewer vegetables. The vegetable industry is now looking for ways to increase vegetable consumption. Hort Innovation Australia and AUSVEG partnered together to explore the potential for optimising portion sizes to increase purchases. This particular research looked closely into the following vegetables: carrots, pumpkin, cabbage, cauliflower, celery and broccoli.

Wasted produce gives the consumer a sense of guilt as they resent paying for what they won't or didn't use. This study showed that as a result of this sense of guilt, consumers would rather pay more per kilo if it meant they wasted less. To prevent wastage, consumers have adjusted their shopping behaviour to avoid wastage, with 81 per cent of consumers trying to purchase the exact volume of vegetables for their specific needs.

As expected, there is not one optimum portion size for each vegetable but offering a greater range of alternatives would most likely result in an overall increase in purchase and consumption. It has been hypothesised that this increase could possibly come at the expense of other vegetables but a survey found that it would be in addition to what is already purchased. New portion sizes are not necessarily essential to be developed with consumers welcoming a greater availability of the standard vegetable options.

Throughout a series of in-store interviews to determine the most desired portion sizes for vegetables, it was noted that consumers would purchase more produce if "excess parts" of the vegetable were removed or some vegetables were available in smaller servings of which, retailers would benefit from offering more fairly basic portion option.

This project was approaching a complex issue to achieve a simplified result, a result in which both growers and retailers can implement to achieve the benefits of increased purchases from consumers.

The full report can be viewed on the AUSVEG Infoveg website:
http://ausveg.com.au/intranet/technical-insights/docs/3111621_164290_VG12094.PDF

Article 5: **R&D Spotlight: Pre-harvest practices that will increase the shelf life of vegetables**
Latest National Vegetable Levy funded research of interest to South Australian growers.

Author: Jose Marques, NSW Department of Primary Industries
Project Number: VG14025

This project assessed current research on the effects of pre-harvest factors on shelf-life and quality of vegetables and developed an information package to increase grower awareness. The aim was to foster adoption of practices that could enhance quality across the industry and potentially add value to Australian vegetables.

For more information see the AUSVEG INFOVEG website or click here to see the report.

Quality and shelf-life are influenced by a large number of specific agronomic, genetic and environmental factors which interact in a complex way.

Key findings of the project recommend understanding pre-harvest interactions and developing crop schedules that can match the best combination of cultivar, growing area, plant growth rate and time of year to achieve the best results in terms of balancing yield and quality/shelf-life. This can only be

achieved with targeted research for each key production area, some of which has been done in Australia for lettuce, spinach and broccoli, although there are major gaps for other vegetables.

Article 6: **R&D Spotlight: Benchmarking Australian regulation against our international competitors**

Latest National Vegetable Levy funded research of interest to South Australian growers.

Author: Control Risks Group Pty Ltd
Project Number: VG13105

Australian growers are facing increased competition in both domestic and export markets. To enhance Australian growers' competitiveness, this project aimed to benchmark regulatory conditions in Australia against its competitors.

The project focuses on regulations supporting food safety, vegetable marketing and transportation, as well as export. Despite lower cost in some competitors' countries, the study found that Australian vegetable products can better place themselves by further strengthening their safety conditions, innovation and marketing ability.

Pressure is increasing in competition in the Australian vegetable industry in both domestic and international markets. Factors that are increasing this pressure are innovation, lower cost base and new access to markets through trade agreements. To better position the Australian vegetable industry in this competitive landscape, Australian vegetable regulations have been benchmarked against our competitors.

The study focuses on the following regulatory areas:

- Primary production
- The use of chemicals
- Heavy-metal contamination
- Packaging
- Storage and transportation
- Food processing
- Labelling
- Infrastructure support
- Information access
- Buying-local initiatives
- Export subsidies and incentives

And in the following countries:

- The United States
- Canada
- New Zealand
- China
- Thailand
- Peru
- Mexico

The results of the study show that Australia's regulatory support towards its vegetable industry is strong overall in the areas of food safety and agricultural marketing. Regulation and enforcement in New Zealand, US and Canada, however, are equally strong, which leaves Australia with only a slight competitive advantage.

In certain areas, the regulatory regime in competitor countries is much stronger than that in Australia. For example, the US has more advanced regulatory support for local-grown produce and safety standards for primary vegetable production. China, Thailand, Peru and Mexico tend to have weaker regulatory support in the areas of food safety and agricultural marketing, but there is a clear trend towards improvement. Thailand, has more rigorous regulation of food packaging than Australia. The low cost of production and a growing safety and marketing support 4 in these developing countries, is likely further to challenge the competitiveness of the Australian vegetable industry.

To access the full report visit the AUSVEG INFOVEG website or click here.

Article 7: **R&D Spotlight: Improving the management of insect contaminants in processed leafy vegetables**

Latest National Vegetable Levy funded research of interest to South Australian growers.

Author: Dr Gordon Rogers, Applied Horticultural Research Pty Ltd
Project Number: VG12108

Insects can be regarded as possible contaminants of processed leafy vegetables. Both wanted and unwanted insects at any stage of their lifecycle can be labelled as unwanted contaminants if they are found in the final consumer product. Insect contamination can result in rejections and/or loss of sales for growers with the added cost of damaging the business reputation, so ensuring produce is insect-free is crucial for the business to operate, despite the challenge of year round insects. The main leafy vegetables that are affected by rejections from buyers from insect contaminants are baby leaf spinach and coral leaf lettuce.

The major insects causing rejections in leafy vegetables are:
- Caterpillars in both larval and adult form
- Aphids, bugs and leafhoppers
- Beetles, both beneficial and pest, e.g. Lady beetles
- Flies
- Ants and wasps
- Earwigs

The project aim of '*Improving the management of insect contaminants in processed leafy vegetables'* was to investigate where further improvements could be made in the supply chain to decrease the potential for any insect contamination in the final product. The main areas of the supply chain focused on were in the field and the processing facility.

Trials in the field were conducted to determine whether current practices could be modified to reduce the number of insects in the crop at the point if harvest. These trials included insect deterrent sprays, insect attractants (to lure insects away from crops), floating row covers as well as the use of harvesting technology to dislodge insects from crops at the point of harvest.

The most effective methods for reducing the level of insect contaminants were the use of a moth attractant plus a knockdown insecticide, light traps to reduce moth populations in a radius of 100m, harvester modifications to remove insects at harvest and floating row covers to exclude insects from baby leaf spinach crops. In the factory, rotating drums removed most of the insect contaminants and dead moths were much easier to remove than live moths.
At two commercial vegetable processing facilities, insect removal techniques on processing lines of each particular business was assessed for efficiency and key areas and approaches for interference were identified. The results were gathered into a best practice guide which was distributed to

vegetable growers and supported by a series of workshops in Queensland, Victoria and Western Australia where 70 growers and agronomists were trained on the techniques. The workshops were run in conjunction with the national Integrated Crop Protection extension project (VG13078).

For more information on *Improving the management of insect contaminants in processed leafy vegetables* contact Gordon Rogers via email at: gordon@ahr.com.au

Article 8: **R&D Spotlight: Market research into vegetable snacking options**

Latest National Vegetable Levy funded research of interest to South Australian growers.

Author: Martin Kneebone, Fresh Logic
Project Number: VG15060

This project aimed to research and identify vegetable snacking options for vegetables in the Australian domestic market. The key outcomes of this project were to identify the distribution channels that have potential to deliver vegetable snacks and assess and profile the viability of locally-produced vegetables being used in processed and shelf-stable vegetable snacks. The project also included a variety of activities which included industry engagement.

The key output of this project is a report which provides:

Key analysis findings and implications for the Australian vegetable industry

- Examples and analysis of distribution channel options for fresh vegetable snacks
- An overview of processing technology relevant to vegetable snacks
- A summary of processed snack product options including vegetable type and technology
- A business strategy framework to incorporate and maintain the integrity of Australian ingredients

There are multiple distribution channels that have been considered including vending machines, education, airlines and workplaces with products of longer shelf life considered for online and department store sales. For vegetables to become more available snacking options, there are real challenges in doing so, with short shelf life being a major hurdle. The snacks need to be small and bite-sized and available in whole forms to maximise freshness. They must also be great tasting and able to be eaten in transport such as on airplanes.

This project discovered that there is a demand for healthier snacks and an opportunity lies in fresh and processed vegetable snack options. Potential investment in snack processing for vegetables must incorporate a sound business strategy to overcome challenges such as the competitive food market, identifying appropriate distribution channels and incorporating a range of products targeted towards consumer needs.

For more information on '*Vegetable snacking options'* click here to see the full report.

Article 9**: R&D Spotlight: Integrating sustainable soil health practices into a commercial vegetable farming operation**

Latest National Vegetable Levy funded research of interest to South Australian growers.

Author: Gordon Rogers, Applied Horticultural Research
Project Number: VG12115

In order to reverse declines in soil health and maintain or improve a successful business in the vegetable industry, sustainable soil health practices are essential. This project looked at "softer" soil management practices such as reduced tillage, cover crops, compost and controlled traffic.

The trials under this project provided validation that "softer" soil management practices can be used in large-scale vegetable production. A key finding being that all cover crops produced a more profitable spinach crop in comparison to a fallowed system. An increase in profitability of around 36 to 48 per cent was observed at completion of a legume cover crop of field peas or clover. This project has provided evidence that cover cropping with controlled traffic and reduced tillage is a sustainable improvement to soil while maintaining and improving yields as well as reducing input costs. A key success in this project was the communication between farmers in the success of the project itself.

Cultivation can be a costly technique and can be damaging to soils. The use of cultivation is beneficial to bury crop residue, relieve compaction and prepare seed beds. These are energy-intensive cultivation methods and can cause a decline in soil organic matter and soil physical structure as well as a reduction in soil microbial activity. This decline can lead to reduced yields and reduced shelf-life of leafy vegetables. Organic matter is essential in soils to provide a food for non-pathogenic soil micro-organisms and it has beneficial outcomes on soil nutrient-holding capacity.

The use of cover crops has shown to protect and improve the soil, despite being labelled as a non-income crop. When used in rotation, cover-crops stabilise soil structure, add soil nitrogen and decrease soil erosion. The use of legumes in vegetable rotations is becoming more common. Cover crops such as Lucerne and vetch have great potential to be used more commonly in rotation, replacing nitrogen into soil. Mustard cover crops are also currently of interest with the plant's ability to bio-fumigate which can control *Verticillium* wilt and *Rhizoctonia* in field. This project looked into the effect of cover crops on paddocks that have been in a reduced till and controlled traffic system for the last 8 years. The soil quality of these paddocks had been degraded after heavy cultivation over decades and farmers were prioritising the restoration of soil quality. To increase soil organic matter and restore soils to a healthy condition management practices such as reduced till and residue mulching where soil is covered and not often cultivated showed to be successful. The project worked with two vegetable growers to document their soil management practices, trial new ones and then communicate with other growers the outcomes.

For more information on '*Integrating sustainable soil health practices into a commercial vegetable farming operation'* see AUSVEG's Infoveg page here or contact Gordon Rogers at gordon@ahr.com.au

Article 10: **Opportunity to provide feedback to Vegetable Industry Strategic Investment Plan**

Opportunity for South Australian growers to have their say on how the National Vegetable Levy is invested by Horticulture Innovation Australia.

AUSVEG SA often receives feedback from growers with ideas or feedback on how the National Vegetable Levy is invested by Horticulture Innovation Australia. Horticulture Innovation Australia are currently calling for feedback on their Vegetable Industry Strategic Investment Plan, which provides an overview of the investment strategy for the coming years. AUSVEG SA encourages all South Australian growers to voice any feedback on investment opportunities, industry needs and areas of concern so that industry can achieve the maximum benefit from these R&D investments.

Growers have until COB **Monday 16 October 2017** to provide final feedback.

To read the final draft SIP and use the simple online form to provide your feedback, visit Hort Innovation's Vegetable Fund page.

You can also provide direct feedback to Hort Innovation's Relationship Managers for the vegetable industry:

Sam Turner on 0418 164 717 or at sam.turner@horticulture.com.au

Brad Wells on 0412 528 398 or at brad.wells@horticulture.com.au

Christian Patterson on 0433 896 753 or at christian.patterson@horticulture.com.au

What is the SIP?
The final industry SIP will be used to help guide Hort Innovation's strategic investment of the vegetable levy, ensuring that levy investment decisions align with industry priorities. It outlines these industry priorities and the core industry outcomes required by investments.

The SIP is designed to represent the balanced interests of the vegetable industry, and the draft has been created in close consultation with growers and other industry stakeholders.

The SIP will be used like a 'roadmap' by the vegetable industry's Strategic Investment Advisory Panels (SIAPs) in providing advice to Hort Innovation on potential levy investments. For more information on the SIAPs, visit Hort Innovation's Vegetable Fund page.

Article 11: **R&D Spotlight: Preserving peak freshness of Broccoli**

Latest National Vegetable Levy funded research of interest to South Australian growers.

Project: Identifying process improvements for preserving peak freshness of Broccoli
Author: Dr Jenny Ekman, Applied Horticultural Research Pty Ltd
Project Number: VG13086

Broccoli is a popular vegetable which is regarded by consumers as a healthy, diverse vegetable for many different meals. Broccoli is not only recognised by having high levels of Vitamin C, but also a source of anti-carcinogens. Previous consumer research conducted in VG12045 found that purchases of broccoli were significantly reduced by inconsistent quality and freshness at retail.

This project focused on this perception and reasons as to why inconsistencies in quality are occurring in broccoli at retail stores. Grocery stores in Sydney, Melbourne, Brisbane and Perth were randomly selected and visited to assess the broccoli displays. The assessed displays varied significantly in quality with some displays multi-layered and hand misted as well as displays with damaged broccoli heads. Many of the best displays were not refrigerated, although it was evident the product was cared for. On display in an open area, the broccoli temperatures averaged 10-15 degrees Celsius. Cold temperatures were also no guarantee of quality. The results suggest that consumers that are expecting to purchase broccoli that was 'excellent' quality would be disappointed in quality at least one in five purchases.

Overall, 28% of the samples would not have met consumer expectations of shelf life and good initial quality. Packing, harvest and transport were also looked into in this project to understand if these were factors that could be the source of variable quality at retail. Despite this, growers involved in this study were recognised as highly aware of the need to cool broccoli quickly after harvest. Broccoli is packed when fully chilled and transported under well refrigerated conditions. Broccoli is still usually packed in Styrofoam containers and top-iced. This keeps the produce cold even if the cold chain is broken. Keeping the broccoli topped with ice does increase transport costs as well as increasing the environmental footprint of the industry. Broccoli is occasionally supplied to some retailers without ice and packed in plastic lined crates. While many of those that are a part of any section of the supply chain are hesitant to not add ice into packing boxes, no negative effects on quality were observed throughout this trial when ice was not used.

The freshness of broccoli at retail is highly variable and quality is not in relation to the display method or price and storage life also cannot be predicted from quality at purchase. It may be possible that consumers do purchase broccoli less often because of quality issues. While the source of variability was not outlined in this project, it appears unlikely that the source of variability is due to poor temperature management by growers and packers.

For more information on *'Identifying process improvements for preserving peak freshness of Broccoli'* click here to see the full report.

Article 12: **R&D Spotlight: Evaluation of automation and robotics innovations**

Latest Hort Innovation-funded research of interest to South Australian growers.

Brought to you by: National Vegetable **Extension Network**

Project: Evaluation of automation and robotics innovations: developing next generation vegetable production systems
Author: Sue Heisswolf, Department of Agriculture and Fisheries
Project Number: VG13113

This project looked into vegetable growing developments in automation, robotics and sensing, with the major focus being on the needs of growers in this field. The project also provided opportunities for discussing which technology would be most useful to the farmer's business in the future. This project was targeted not only to the innovative growers, including their service providers in the state of Queensland, but also to industry government organisations and agricultural machinery developers. Key project contributors were the CSIRO, Queensland University of Technology (QUT), the Australian Centre of Field Robotics (ACFR) and the Queensland Department of Agriculture and Fisheries (DAF).

As a result of the project, researchers had a better understanding of:

- Grower and industry priorities for R&D in automation, robotics and sensing
- The challenges, constraints and potential opportunities for commercialisation and adoption of these technologies including return on investment
- The applicability of concepts and tools for analysis to increase productivity of horticultural businesses.

Activities from this project have created and strengthened relationships as well as identifying professionals in this field, for future regional collaborations between growers, industry and stakeholders. Successful relationship building was in on-farm visits with growers which lead to many R&D proposals.

For more information on this project click here to see the full report.

Article 13: **R&D Spotlight: Vegetable WHS training resources**

Latest Hort Innovation-funded research of interest to South Australian growers.

Project: VegWHS Training Resources
Author: Luke Rolley, RMCG
Project Number: VG16031

The significantly high rate of death and injury in the agricultural sector is substantial and regularly considered an area of concern. The importance of providing a safe work environment is a major issue for vegetable farms. A recent skills audit and review of skills and training in the vegetable industry demonstrated a requirement for development of a functional WHS system and support for

growers to implement improved practices on-farm.

The project revealed:

- There is a knowledge gap in regards to grower's information on WHS
- There is a negativity towards WHS from growers and in doing so, will only respond when it is required for events such as work safety audit
- The perceived costly process of WHS to farmers is seen only as an added cost to a business

As a result, RMCG has developed a safety management system and safety guidelines for growers to use in their businesses. These materials are available on a carrot shaped ('Carrot stick') USB from VegNET South Australia.

A series of 8 video-based training resources have been developed:

- Overview of WHS
- Harvester safety
- ATV safety
- Powerlines safety
- Accident and incident reporting
- Machinery guarding
- Toolbox meetings
- Staff inductions

These videos provide a low cost, efficient resource to help growers implement the VegWHS package and ultimately safe work practices on their farms. AUSVEG SA recommends that our growers utilise these resources and implement them into current business practices.

Accessing the videos
For more information on this project contact Luke Rolley at RMCG at luker@rmcg.com.au or for a Carrot Stick USB with this project's outputs contact Hannah McArdle on 0408 475 995 or hannah.mcardle@ausveg.com.au

Article 14: **R&D Spotlight: Review of current irrigation technologies**

Latest Hort Innovation-funded research of interest to South Australian growers.

Project: Review of current irrigation technologies
Author: Bill Yiasoumi, Irrigation Australia Ltd
Project Number: VG14048

The purpose of this project was to allow Australian vegetable growers gain a greater insight of the available and emerging irrigation practices that could improve business profitability and promote adaption of the technologies. This project had two phases with the first being a review of current practices and extension planning. The second phase was the delivery and extension of the workshop review findings. Outputs of this project include YouTube videos and workshops. Specifically, 19 workshops were held with a total of 226 attendees, 32 interviews with growers were conducted and presentations at conferences were completed as part of this project.

The key outcomes of this project were:

- Identification of adoption gaps with technologies such as variable rate irrigation and drip irrigation.

- The identified gaps will be utilised for further research and planning. If addressed, the gaps can help vegetable growers to meet the project objectives of adoption to improve resource management and profitability for vegetable growing businesses.
- An increase of awareness with growers of current and emerging vegetable irrigation technologies as uncovered in the workshops and interviews.

The scoping process that was conducted in this project also identified specific actions that the Australian vegetable industry can undertake in irrigation. If these actions are acted upon, outcomes such as increased water and nutrient use efficiency, increased capacity and knowledge of vegetable growers as well as irrigation designers can be possible.

Key recommendations:
Recommendations for future R&D in irrigation for the Australian vegetable industry have been provided from the result of this project. These recommendations involve the essential research which is needed to identify adoption hurdles of irrigation technologies and management practices in the Australian vegetable industry. In addition to this recommendation, it was also suggested that applied research into drip irrigation is conducted in the future, with costs and benefits for a broader range of vegetable crops. Further work was also proposed to build understanding with growers of in irrigation design.

To read more about this project follow this link, jump onto AUSVEG's Infoveg website or visit the Irrigation Australia website here

Article 15: **R&D Spotlight: Management of insecticide resistance in Green Peach Aphid**

Latest Hort Innovation-funded research of interest to South Australian growers.

Project: Management of insecticide resistance in the green peach aphid
Author: Paul Umina, Cesar pty ltd
Project Number: VG12109

The Problem
The green peach aphid (GPA) is a major pest for horticultural crops in Australia, particularly vegetable crops such as capsicum, tomato, broccoli and lettuce. The main method of controlling GPA is the use of insecticides although pesticide resistance in these chemistries is increasing, creating major issues over the short and long term. The aim of this project was to understand and prepare the Australian vegetable industry with knowledge of GPA resistant populations and better insecticide resistant management strategies.

Key Findings and Outcomes
This project demonstrated widespread resistance in GPA to three insecticide groups that are most commonly used to control aphids which are synthetic pyrethroids, carbamates and organophosphates. Low level resistance to neonicotinoids were detected in GPA populations in QLD, SA & WA, all of which is the first time neonicotinoid resistance has been noted in Australia. It was also found that neonicotinoids are a high-use chemical, thus there is a need for new chemistries and GPA management practices required to manage GPA and/or control the pest. It appears that GPA is able to move freely between crops, between production areas and even across states. A chemical group rotation management plan is pivotal to prevent GPA resistance increasing.
Findings of this project have been incorporated into a regional resistance management plan although this management plan was largely focused on GPA in the vegetable growing area in Bundaberg, Queensland, some practices are applicable for vegetable farms Nation-wide.

Future Recommendations

- It is important to improve insecticide use to control GPA in horticultural crops. The project findings, particularly the increasing incidence neonicotinoid resistance in GPA, need to be broadly communicated to Australian vegetable growers.
- Surveillance of GPA must continue, monitoring for resistant GPA populations within vegetable production regions.
- The management strategy for control of GPA should be altered to suit all vegetable growing regions in Australia as well as being accompanied by a communication plan (workshops, field days etc.)
- There is potential for IPM programs to control GPA
- Development of a guide with registered insecticides and their impact on beneficial species of vegetable crops, assisting growers with IPM decision making whilst maximising the positive impact of beneficial species.

Future research will need to be conducted to understand the interactions between aphids and viruses to help with management tools such as prediction models.

To read more on this Hort Innovation National Vegetable Levy-funded project see the Infoveg website or follow this link for direct access

Article 16: R&D Spotlight: Market Opportunity for Vegetable Juices

Latest Hort Innovation-funded research of interest to South Australian growers.

Project: Market Opportunity for Vegetable Juices
Project leader: Michael Feely
Delivery partner: Horizon Consumer Science
Project code: VG16016

Summary
The aim of this project was to improve industry understanding of opportunities in the vegetable juice market. The goal was to improve insights into this market for growers interested in investigating value-adding opportunities.

The first stage of this project involved qualitative research to gain insight into consumer behaviour as well as identifying strategies that might increase vegetable juice consumption. The second stage involved an online survey which was completed by Australian consumers, representing the Australian public. The third and final stage of the research involved face-to-face interviews with growers and industry people. This was done to assess which opportunities exist to increase vegetable consumption and how many growers can recognise these opportunities.

The key findings from this project were:

- Vegetable juice market in Australia is small
- Only a small range of vegetables are being juiced
- 80% of Australians have tried vegetable juice but only 3% consume it regularly
- There are significant barriers to broadening vegetable juice consumption
- There is a perception that vegetable juice does not taste good

A plan had been proposed to assist industry stakeholders to think about the niche market. This plan involves:

- Marketing to increase vegetable intake
- Products that entice consumers
- Bottled products with low vegetable content
- An “Australian Farmers Juice” brand

It is acknowledged that Hort Innovation do not have a marketing levy at this time. The intent of this project is to provide Australian vegetable growers with an insight to market.

Click here to access the full report on the InfoVeg website.

Article 17: R&D Spotlight: Improved skill for regional climate in the ACCESS-based POAMA model

Latest Hort Innovation-funded research of interest to South Australian growers.

Brought to you by: National Vegetable **Extension Network**

Project: Improved skill for regional climate in the ACCESS-based POAMA model
Project leader: Debra Hudson, Oscar Alves, Li Shi and Griffith Young
Delivery partner: Bureau of Meteorology
Project code: VG13092

This year, the vegetable industry will gain access to more efficient climate forecast from Bureau of Meteorology which can help plan weeks and seasons ahead. A new seasonal forecast system, *ACCESS-S,* is being developed by the Bureau, replacing the current system, *POAMA.*

The aim of this project is to evaluate climate forecasts made by *ACCESS-S1* for weeks ahead for 9 vegetable growing regions in Australia. Some of the features of *ACCESS-S1* that are greater than the POAMA system are increased spatial resolution and improved representation of the Australian climate.
ACCESS-S1 is significantly more accurate than POAMA for longer forecasting of rainfall and maximum (Tmax) and minimum temperature (Tmin) over vegetable regions. Seasonal timescales of accuracy are similar between the two models, although ACCESS-S1 is greater for seasonal forecasting of Tmin than POAMA.

Experimental forecast products based on ACCESS-S1 have been developed for vegetable regions. The products are available from the website (http://poama.bom.gov.au/project/hia.html) and feedback is encouraged.

The project demonstrated that there is still space for improvement in accuracy of ACCESS-S1 for vegetable growing regions in the future. Specifically, forecasts with soil moisture conditions vary between years will increase accuracy of Tmax over eastern Australia vegetable regions which is being addressed in version 2 of the system, ACCESS-S2.

The Bureau recommends vegetable growers trial the experimental forecast performance products and that future within the industry should aim to determine the value of forecasts with respect to management decisions, such as when to plant or harvest, when to apply fertilizer and for irrigation scheduling. In addition, it is worth considering if there is a need for tailored forecast products or indices of interest to vegetable growers. Going forwards, to help farmers improve productivity and profitability, there is a need to bridge the gap between climate forecasts and on-farm business decisions.

Click here to access the full report on the InfoVeg website.

Article 18: R&D Spotlight: On-farm evaluation of vegetable seed viability using non-destructive techniques

Project: On farm evaluation of vegetable seed viability using non-destructive techniques
Project leader: Dr Jitka Kochanek
Delivery partner: The University of Queensland
Project code: VG16028

High seed quality is an essential factor for vegetable seeds to grow and if compromised, a substandard crop will grow and some farm inputs and investments may also be compromised. The aim of this project was to provide the Australian Vegetable industry with options to overcome low seed quality. This project extends from a previous project (VG15021) which was to develop technologies for the industry to improve seed quality and establishment. The project is aimed at levy payers as well as industry people within the Australian vegetable industry with supply chain as secondary audience.

Project activities involved:

- Interviews with growers to understand opportunities and needs. Farm visits with 10 leading growers
- A literature review of:
- 2a) Current and new technologies available to growers for maximising seed vitality
  2b) Information regarding seed longevity of economically important vegetable crops
  2c) Conditions required to maximise seed quality

The outputs of this project are:

- A review of industry needs and recommendations from the interviews and surveys, noting areas for improvement and recommendations for future investment for farm seed quality
- Knowledge to assist in increasing seed vitality, focusing on emerging technologies for non-destructive grade seed viability
- Knowledge of research providers who can deliver development of technologies via future R&D levy funding
- Communication with levy payers via a field day and three industry bulletins detailing survey outcomes and recommendations for technology and future project development

Outcomes are the recommendations for new R&D investments towards the following:

- Development of novel technologies with the potential for real time grading to maximize vegetable seed quality and
- A long-term program to optimise seed quality at the seed production and postharvest phase, to ensure seeds are of maximal quality before they reach the grower and then maintain quality on farm.

A date is scheduled for autumn 2018 to discuss R&D strategies with key Levy payers towards future project development. Society benefits of new technologies and programs to optimize seed quality are reduced resource wastage - such as labour, fertilisers, irrigation, mechanisation and crop protection materials - and therefore a positive image of the industry as having sustainable produce.

For more information on this project, follow this link to the Infoveg website.

Article 19: R&D Spotlight: Surveillance of tomato potato psyllid in the eastern states and South Australia

Latest levy funded research of interest to South Australian growers.

Project leader: Dr Calum Wilson, Tasmanian Institute of Agriculture (TIA)
Project Number: MT16016

Summary
Bactericera cockerilli, more commonly known as Tomato-potato psyllid or TPP is a major threat to the Australian Horticultural industry. TPP consumes the inside of the plant stem and can also transmit the bacterium, *Candidatus Liberibacter solanacerarum* (CLSo). This bacterium causes Zebra chip disease and psyllid yellows. TPP and CLSo were found in 2006 in New Zealand and again in 2014 on Norfolk Island. In early 2017, TPP (but NOT CLSo) was found in Western Australia. Both of these pests have already had a detrimental impact on the solanaceous crop industries where discovered which results in millions of dollars lost annually. The threat of TPP and CLSo invading the other states is considerable and early detection is crucial to eradicate.

Since 2011, the Tasmanian Institute of Agriculture (TIA) has operated a surveillance program to monitor for incursions of TPP in eastern Australian processing potato crops using yellow sticky traps. This document is a final report for the 2017-2018 project. As well as monitoring for TPP, numbers of native psyllids were recorded on traps. The project also involved training for industry people in the identification of TPP and CLSo symptoms. This was conducted in Eastern Australia with State counterparts. Extension materials were also produced and given to participants at TPP events.

Over the length of this project, approximately 3,000 sticky traps were sent to participants in the eastern states. Almost 50% of these traps were returned for screening and no TPP was detected during this trapping period. It was recommended that the TPP surveillance program continue to provide assurance of Area of Freedom status for industry stakeholders.

Through the early engagement with State Departments of Primary Industries the project enabled a greater co-ordination approach to state surveillance activities, which has assisted with issues around state biosecurity. With increased participation from growers of Solanaceae crops, the project has created a dataset that supports many states area freedom but also provides a baseline of data prior to an incursion of TPP for future research.

For more information on this project see full report here.

Appendix 1.1.1 Vietnamese Newsletter Articles:

NGHIÊN CỨU MỚI TRONG NGÀNH RAU QUẢ

Chúng tôi rất hân hạnh giới thiệu đến bà con Nông gia những thành tựu nổi bật trong các nghiên cứu mới nhất liên quan tới ngành Rau quả. Đây là những thông tin hữu ích để bà con Nông gia biết thêm về nhiều mặt của nghề trồng rau quả và phát triển công việc làm ăn của mình. Những nghiên cứu được thực hiện bởi các nhà khoa học danh tiếng và nhiều kinh nghiệm với Nghề Rau quả, với sự tài trợ tài chính từ quỹ Phát triển Nông nghiệp Úc, vì mục tiêu phát triển ngành rau quả Nam Úc

Hướng dẫn thực hành An toàn lao động tại Nông trại rau quả:

Được tài trợ bởi Hort Innovation

Cung cấp bởi: National Vegetable Extension Network

Tên dự án: Tài liệu hướng dẫn thực hành An toàn lao động tại Nông trại rau quả

Tác giả: Luke Rolley, Tập đoàn RMCG

Số: VG16031

Thống kê cho thấy có một tỷ lệ thương vong khá cao của lao động làm việc trong lĩnh vực nông nghiệp. Đây là một vấn đề rất đáng lo ngại. Điều này càng cho thấy tầm quan trọng của việc thực hành an toàn lao động tại các Nông trại rau quả. Việc giám sát và tái kiểm kỹ năng thực hành an toàn lao động tại các Nông trại rau quả gần đây cũng cho thấy việc cần thiết phải phát triển một hệ thống hiệu

Quả Hướng dẫn thực hành a toàn Lao động nhằm giúp những người Chủ nông trại áp dụng và tăng cường hiệu quả thực hiện a toàn tại các Nông trại.

Kết quả nghiên cứu cho thấy:

- Chủ Nông trại thiếu kiến thức về An toàn lao động
- Chủ Nông trại không thực hiện An toàn lao động và chỉ miễn cưỡng áp dụng khi có hoạt động thanh tra
- Chi phí Thực hành An toàn lao động bị xem như một loại gánh nặng trong đầu tư phát triển

Do đó, Tập đoàn RMCG đã đầu tư nghiên cứu và phát triển một Hệ thống quản lý An toàn lao động và Hướng dẫn thực hành an toàn lao động để cung cấp cho các Chủ nông trại. Các tài liệu này được gói gọn trong một USB hình cây Cà rốt do VegNET Australia cung cấp.

Trong USB này, người xem có thể dễ dàng tìm thấy một tập hợp 8 bài giảng trên nền tảng Video bao gồm:

- Tổng quan về Thực hành An toàn lao động
- An toàn cho người thu hoạch
- An toàn khi điều khiển máy ATV (máy cày)
- An toàn khi sử dụng điện
- Báo cáo tai nạn hoặc sự cố
- Giám sát máy móc, phương tiện

- Cảnh báo an toàn đầu giờ làm việc
- Hướng dẫn An toàn lao động cho công nhân mới

Bộ bài giảng này cung cấp cho các Chủ Nông trại một hệ thống thực hành an toàn lao động với mức chi phí thấp mà hiệu quả trên Nông trại của mình. Quỹ hỗ trợ Nông dân trồng rau quả Nam Úc (AusvegSA) khuyến cáo bà con nông gia nên sử dụng hệ thống này cho Nông trại của mình.

Để biết thêm thông tin về dự án, bà con liên hệ Luke Rolley từ Tập đoàn RMCG tại đỉa chỉ email luker@rmcg.com.au. Để có USB hình cây Carot chứa 8 bài giảng, liên hệ Hannah McArdle số di động: 0408475995 hoặc email: Hannah.mcardle@ausveg.com.au.

Article 2:

Tìm hiểu nguyên nhân ảnh hưởng đến độ tươi ngon của rau cải

Dự án được thực hiện từ nguồn tài trợ Lệ phí rau quả

Cung cấp bởi National Vegetable Extension Network

Tên dự án: Phát triển quy trình bảo quản độ tươi ngon của Rau cải

Tác giả: Tiến sĩ Jenny Ekman, Công ty Nghiên cứu phát triển quỹ Hort

Số dự án: VG13086

Rau cải là một loại rau rất phổ dụng và được người tiêu dùng xem như một loại rau có lợi cho sức khỏe, có khả năng thay thế nhiều loại rau quả khác và có thể chế biến theo nhiều cách khác nhau cho bữa ăn đa dạng. Rau cải không chỉ chứa hàm lượng Vitamin C cao, mà còn là một nguồn cung cấp tinh chất chống ung thư. Mặc dù vậy, nghiên cứu gần đây (số VG12045) cho thấy sự sụt giảm lượng tiêu thụ rau cải mà nguyên nhân chính nằm ở sự thất thường về chất lượng và độ tươi khi rau được đưa ra thị trường.

Dự án này tập trung nghiên cứu các nguyên nhân khiến rau cải giảm chất lượng khi được đưa ra bán tại các đại lý. Trong quá trình nghiên cứu, các cửa hàng rau quả tại Sydney, Melbourne, Brisbane và Perth được lựa chọn một cách bất kỳ và kiểm tra, tìm hiểu về cách rau cải được bày bán tại các cửa hàng này. Kết quả cho thấy việc bày bán rau cải ở các cửa hàng rất đa dạng và có nhiều thay đổi tác động đến chất lượng rau. Trong số các mẫu hình bày bán được đánh giá tốt thường là cách bày bán không cấp

lạnh. Ở các khu vực bày rau mở, nhiệt độ của rau cải thường ở mức 10 đến 15 độ C. Việc để lạnh nhiều khi cũng không phải là cách đảm bảo cho rau có chất lượng tốt. Kết quả cho thấy cứ năm lần mua với hy vọng là rau chất lượng ưng ý, thì khách hàng chỉ vừa ý có một lần.

Có 28% mẫu rau cải không đáp ứng kỳ vọng của người tiêu dùng về chênh lệch chất lượng giữa rau sau khi để ở nhà một vài ngày so với chất lượng ban đầu của rau. Dự án cũng nghiên cứu cả quy trình thu hoạch, đóng gói và vận chuyển để tìm hiểu xem các yếu tố này tác độnh ra sao đến chất lượng rau tại các cửa hàng bán lẻ. Các chủ Nông trại tham gia trong nghiên cứu này đều biết rõ phải làm mát rau cải nhanh sau khi chúng được thu hoạch. Rau cải được đóng gói khi đã được

cấp lạnh đầy đủ và được vận chuyển trong điều kiện bảo ôn phù hợp nhất. Các thùng hàng vận chuyển rau cải đều là Container lót mút xốp và cấp đông trần. Phương pháp này giữ cho sản phẩm trong thùng lạnh ngay cả khi mở container. Cấp đông trần container cho các thùng hàng đựng rau cải làm tăng chi phí vận chuyển và tăng chi phí môi trường cho ngành rau. Cũng có trường hợp rau cải được đưa ra tiệm bán mà không qua cấp đông, rau được đóng gói trong bao gói nilon, tuy nhiên kết quả nghiên cứu cho thấy không có tác động cụ thể của việc vận chuyển mà không bảo quản bằng cấp đông đến chất lượng của rau cải. Độ tươi của rau cải tại các cửa hàng rất khác nhau và chất lượng thì không mấy liên quan đến cách bày bán, giá bán và khả năng giữ rau cũng khó biết từ chất lượng rau khi mua vào. Như vậy có thể cho rằng việc khách hàng ít mua rau thường xuyên chỉ là do chất lượng của rau. Sự chênh lệch và thay đổi về chất lượng, theo nghiên cứu của dự án này, chính là việc đóng gói và bảo quản nhiệt độ từ Nông trại có chất lượng khác nhau từ các Nông trại khác nhau.

Article 3:

Đánh giá hiệu quả sử dụng Tự động hóa và Robot trong công nghiệp Rau quả

Một dự án được tài trợ bởi Hort Innovation

Cung cấp bởi: National Vegetable Extension Network

Tên dự án: Đánh giá hiệu quả sử dụng tự động hóa và robot: phát triển hệ thống sản xuất rau trong tương lai

Tác giả: Sue Heisswolf, Cơ quan Nông nghiệp và Thủy sản

Số dự án: VG13113

Dự án này nghiên cứu sự phát triển và mở rộng công nghệ tự động hóa, cảm biến và robot trong lĩnh vực trồng rau quả, tập trung tìm hiểu về các nhu cầu của Chủ Nông trại trong lĩnh vực này. Dự án cũng thảo luận về loại hình công nghệ nào sẽ là hữu dụng nhất đối với nông gia trong tương lai. Dự án không chỉ hướng tới các Chủ nông trại năng động cùng với các nhà cung cấp thiết bị cho nông trại của họ ở bang Queensland mà còn hướng tới các tổ chức thuộc chính quyền trong lĩnh vực nông nghiệp và các nhà nghiên cứu, phát triển máy móc nông nghiệp. Tham gia chính vào dự án gồm có CSIRO, Trường đại học QUT, Trung tâm nghiên cứu phát triển Robot Australia ACFR và Bộ Nông nghiệp thủy sản Bang Queensland DAF.

Kết quả nghiên cứu của dự án giúp các nhà nghiên cứu hiểu rõ hơn một số vấn đề bao gồm:

- Mối quan tâm của Chủ Nông trại và ngành nông nghiệp trong nghiên cứ phát triển Tự động hóa, cảm biến và robot
- Thách thức, trở ngại và những tiềm năng phát triển thương mại, sử dụng những công nghệ này và khả năng thu hồi vốn đầu tư
- Khả năng ứng dụng và phương pháp phân tích nhằm tăng năng suất lao động trong lĩnh vực nông nghiệp.

Hoạt động của dự án đã giúp tạo ra và củng cố nhiều mối quan hệ, xác định các chuyên gia trong lĩnh vực này, mở ra cơ hội hợp tác giữa Chủ nông trại, nhà quản

lý và các bên liên quan. Thành công trong việc xây dựng quan hệ thông qua những chuyến điền dã trên các Nông trại là tiền đề của nhiều dự thảo nghiên cứu phát triển khác.

Appendix 1.1.4

Article 4:

Tổng quan về công nghệ tưới tiêu hiện tại

Dự án được tài trợ bởi Hort Innovation

Cung cấp bởi: National Vegetable Extension Network

Tên dự án: Tổng quan về công nghệ tưới tiêu

Tác giả: Bill Yiasoumi, Công ty Thủy lợi Australia

Số dự án: VG14048

Mục tiêu của dự án này nhằm cung cấp cho người trồng rau quả Australia những thông tin và kiến thức mới nhất về các phương thức thực hành tưới tiêu đang được sử dụng và đang được phát triển để cải thiện và nâng cao hiệu quả sản xuất, kinh doanh rau quả, cũng như thúc đẩy việc ứng dụng công nghệ trong sản xuất. Dự án được chia làm hai giai đoạn. Giai đoạn một, dự án sẽ tập trung tìm hiểu tổng quan các phương pháp thực hành tưới tiêu đang được áp dụng và dự án mở rộng sản xuất. Giai đoạn hai của dự án sẽ tập trung cung cấp và mở rộng những thông tin mà kết quả nghiên cứu đã chỉ ra. Kết của của dự án sẽ được tập hợp trong các buổi Hội thảo và các Video trình bày trên trang Youtube. Cụ thể, đã có 19 hội thảo được tổ chức với sự tham dự của 226 người, 32 cuộc phỏng vấn với Chủ Nông trại được ghi lại và trình chiếu tại các cuộc hội thảo.

Những kết quả nội bật của dự án gồm:

- Phát hiện khoảng trống trong ứng dụng công nghệ tưới tiêu, ví dụ như việc ứng dụng công nghệ nhỏ giọt và công nghệ tưới nhiều tỷ lệ
- Những phát hiện này sẽ được sử dụng trong các nghiên cứu, quy hoạch trong tương lai. Nếu những khoảng trống này được giải quyết, sẽ giúp người trồng rau đạt được mục tiêu mà dự án đề ra đó là cải thiện việc quản lý tài nguyên và nâng cao tỷ suất lợi nhuận trong nghề trồng rau.
- Nâng cao nhận thức của các Chủ Nông trại về công nghệ tưới tiêu đang được ứng dụng hoặc sẽ được ứng dụng trong tương lai gần, những vấn đề được nêu ra trong các cuộc phỏng vấn và trao đổi tại Hội thảo.

Trong quá trình xác định phạm vi của dự án, các nhà nghiên cứu cũng phát hiện nhiều hoạt động cụ thể của lĩnh vực tưới tiêu mà những người hoạt động trong lĩnh vực trồng rau của Australia nên ứng dụng. Nếu như áp dụng các hoạt động này vào tưới tiêu, chắc chắn sẽ thu được kết quả tốt trong việc việc sử dụng hiệu quả nước tưới và dưỡng chất, tăng cường năng lực và kiến thức của chủ Nông trại và người thiết kế hệ thống tưới tiêu.

Khuyến nghị:

Kết quả nghiên cứu của dự án đã đưa ra các khuyến nghị nghiên cứu trong tương lai trong lĩnh vực thủy lợi của ngành Rau quả Australia. Trong số đó có khuyến nghị về sự cần thiết triển khai nghiên cứu về những trở ngại trong ứng dụng công nghệ tưới tiêu và thực hành quản lý của ngành trồng rau quả Australia. Thêm vào đó, dự án cũng khuyến nghị cần triển khai nghiên cứu ứng dụng công nghệ tưới nhỏ giọt trong tương lai, việc này sẽ hỗ trợ tốt cho phát triển các vụ rau ở quy mô lớn hơn. Cũng cần tăng cường thêm sự hiểu biết lẫn nhau giữa các chủ Nông trại và những người làm công việc thiết kế thủy lợi.

Để tìm thêm thông tin về dự án có thể vào trang web của AUSVEG infoveg hoặc trang web của Bộ thủy lợi Australia.

Appendix 1.1.5

Article 5:

Quản lý vấn đề kháng thuốc của Rệp hồ đào xanh

Một nghiên cứu được tài trợ bởi Hort Innovation

Cung cấp bởi: National Vegetable Extension Network

Tên dự án: Quản lý việc kháng thuốc của Rệp hồ đào xanh

Tác giả: Paul Umian, Công ty Cesar pty ltd

Số dự án: VG12109

Vấn đề:

Rệp hồ đào xanh (GPA) là một loại sâu hại phổ biến đối với các nông sản của nước Australia, đặc biệt là đối với các loại rau quả như ớt, cà, rau cải và xà lách. Trước nay, cách thức xử lý GPA phổ biến vẫn là dùng thuốc xịt trừ rệp, tuy nhiên qua thời gian, khả năng kháng thuốc của loại sâu này tăng lên và trở thành vấn đề nghiêm trọng cả

ngắn hạn cũng như dài hạn. Mục tiêu của dự án này nhằm cung cấp kiến thức và sự sẵn sàng cho những người trong công nghiệp Rau quả Australia về các chủng loại Rệp hồ đào xanh kháng thuốc cũng như chiến lược quản lý hiệu quả việc kháng thuốc của bọ rệp.

Kết quả nghiên cứu:

Từ kết quản của nghiên cứu này cho thấy sự kháng thuốc đã lan rộng trong loài Rệp hồ đào xanh đối với ba nhóm thuốc trừ rệp hiện vẫn đang được dùng phổ biến bao gồm Thuốc trừ sâu tổng hợp, Carbamates hay Organophosphates. Một mức kháng thuốc thấp đối với nhóm thuốc trừ rệp Neonicotinoids cũng được ghi nhận khi khảo sát trên quần thể GPA tại các bang Queensland, Nam Úc và Tây Úc, đây là lần đầu tiên việc kháng thuốc của GPA đối với nhóm thuốc neonicotinoids được phát hiện ở Australia. Nghiên cứu cũng chỉ ra tần suất sử dụng cao đối với thuốc trừ rệp nhóm neonicotinoids, đồng nghĩa với việc cần có các loại thuốc mới và phương pháp quản lý hữu hiệu nhằm hạn chế sự lây lan và kháng thuốc của GPA. Thực tế cho thấy Rệp hồ đào xanh có khả năng di chuyển giữa các mùa vụ, các khu vực trồng trọt và di chuyển xuyên tiểu bang. Chỉ bằng cách áp dụng hợp lý một kế hoạch quản lý chặt chẽ, quay vòng sử dụng hóa chất mới có thể phòng trừ được việc tăng khả năng kháng thuốc của GPA.

Những kết quả nghiên cứu của dự án này, mặc dù được tập trung vào việc quản lý một vùng, cụ thể ở đây là vùng trồng rau ở Bundaberg, bang Queensland, tuy nhiên có nhiều ứng dụng rút ra từ dự án có thể được áp dụng cho người trồng rau trên toàn quốc.

Khuyến nghị:

1. Việc cải tiến cách trừ sâu đóng vai trò quan trọng trong phòng trừ GPA đối với nền nông nghiệp Australia. Các kết quả của dự án này cần được phổ biến rộng rãi tới người trồng rau Australia, đặc biệt là kết quả về hiện tượng tăng kháng thuốc của GPA đối với nhóm thuốc trừ rệp neonicotinoid
2. Tiếp tục giám sát chặt GPA, kiểm soát việc kháng thuốc của các chủng GPA trong các vùng trồng rau khác nhau một cách thường xuyên
3. Chiến lược phòng trừ GPA cần được thay đổi cho phù hợp với từng vùng trồng trọt trên phạm vi toàn nước Australia đồng thời tổ chức song các biện pháp truyền thông (ví dụ hội thảo, điền dã …)
4. Tiềm năng trong việc áp dụng IPM (Phòng trừ sâu bệnh tổng hợp) để kiểm soát GPA
5. Cần có thêm nghiên cứu để xác định khả năng tương tác giữa các loài Rệp và các chủng Viruses trên cây trồng để giúp tạo ra các công cụ dự báo sâu bệnh chính xác hơn.

Để tìm hiểu kỹ hơn thông tin về dự án này, vui lòng truy cập trang web infoveg.

Appendix 2: Fact Sheets

Appendix 2.1

Fact Sheet 1:

VEGETABLE AND POTATO BIOSECURITY PROGRAM

National Vegetable Extension Network
SOUTH AUSTRALIA

SUMMARY

Biosecurity preparedness has reduced the risks and threats of the world's pests and diseases arrival, and prevented major outbreaks, in Australia.

Population growth, increased trade and passenger volume, and increasing imports from a number of countries are increasing biosecurity risk to Australia, despite its geographical isolation. The Australian vegetable industry's response to this increased risk includes investment in planning programs which build resilience to exotic pest and disease incursion.

Biosecurity planning provides a mechanism for the vegetable industry, government and other relevant stakeholders to actively determine pests of highest priority, analyse the risks they pose and put in place procedures to reduce the chance of pests becoming established - and to minimise the impact if a pest incursion occurs.

Risk minimisation and effective threat response procedures are vital for the future sustainability and viability of the Australian vegetable industry. Through pre-emptive planning, the industry will be better placed to maintain domestic and international trade, negotiate access to new overseas markets, and reduce the social and economic costs of pest and disease incursion on growers and the wider community.

WHATS INVOLVED

The Vegetable and Potato Biosecurity Program (co-managed by Plant Health Australia and AUSVEG, employs two Vegetable and Potato Security officers (VPBOs), Jessica Lye and Callum Fletcher, whose role is to improve biosecurity risk preparedness and response mechanisms for the vegetable industry on a nation-wide scale. The program has been running for over three years, with the current phase funded until June 2019. Jess and Callum facilitate cooperation between vegetable and potato growers, government departments and industry groups for the purposes of raising awareness around biosecurity best-practice in production regions.

EXTENSION FOCUS

Extension activities are a major focus of the biosecurity program. Jess and Callum frequently speak about the program and biosecurity best-practice at industry meetings and events. In September 2016 the VPBOs visited the Greater Sydney region and co-hosted a biosecurity workshop with Greater Sydney Local Land Services.

Aside from national extension activities, the biosecurity program aims to produce practical biosecurity resources for growing operations. One product developed from the program is the vegetable and potato industry guidance booklet named appropriately as DIY Biosecurity. The booklet includes checklists and risk assessment templates and aids in development of an on-farm biosecurity plan.

WHERE TO FIND RESOURCES

DIY Biosecurity, and related biosecurity resources developed by the program, can be found on the AUSVEG website at ausveg.com.au/biosecurity. The program also releases a biosecurity e-bulletin that includes pest updates and regular articles in vegetables and potatoes Australia magazines. The program also provides a mechanism for the vegetable and potato industry to be represented at biosecurity forums and during exotic pest incursions (under the Emergency Plant Pest Response Deed). All available biosecurity resources developed by the program are being translated into Khmer and Vietnamese.

ENGAGEMENT WITH VegNET

The VPBOs welcome the opportunity to tie in extension activities with the National Vegetable Extension Network for the length of the current project which concludes June 2019.

For further information on the program contact the AUSVEG National Manager –Science and Extension, Dr Jessica Lye at Jessica.lye@ausveg.com or at 03 9882 6722.

National Vegetable Extension Network · AUSVEG SA · AUSVEG · Horticulture Innovation Australia

Appendix 2.2

Fact Sheet 2:

VEGETABLE AGRICHEMICAL PEST MANAGEMENT NEEDS & PRIORITIES

National Vegetable Extension Network
SOUTH AUSTRALIA

SUMMARY

Growers of some horticultural crops suffer from a lack of legal access to crop protection products (pesticides). The problem may be that while a relatively small crop area is valuable in an agricultural sense, it is not of sufficient size for AgChem companies to justify the expense of registering a product to use on that crop. Alternately, the disease, pest, or weed problem may be regional or spasmodic, making AgChem companies unwilling to bear the initial high cost of registering suitable pesticides.

Growers may at times be in a situation where they face severe losses from diseases, pests and weeds if they do nothing to protect their crops, or face penalties if they use a product that is not registered or available via a permit. The vegetable industry is aware of the possible consequences of the use of unregistered or non-permitted pesticides.

Pesticides have always been an important tool in the production of vegetables. They control the various diseases, weeds and insects that affect the crop and can cause severe economic loss in modern, high intensity growing operations.
To establish direct grower interaction and ensure that the agrichemical needs of the vegetable sector are accurately recorded and understood, AUSVEG has commenced coordination of the project Vegetable Agrichemical Pest Management Needs and Priorities (VG16060), a strategic levy investment under the Hort Innovation Vegetable Fund.
The project's objective is to coordinate vegetable industry agrichemical pest needs by identifying and prioritising potential gaps through implementation of an effective prioritisation process for the vegetable industry.

WHATS INVOLVED

Coordinating this project is Patrick Arratia, who joined AUSVEG in July 2017. Patrick previously worked at Bayer Crop Science in South Australia as a breeding agronomist managing the canola contra season program. He has experience in agronomy, qualifications in agricultural engineering and a passion for the agricultural industry.

The most meaningful method of engagement for this project will be through regional workshops, at least twelve workshops will be held each year to discuss Australian vegetable growers agrichemical needs/gaps and priorities. At these workshops, in conjunction with existing Strategic Agrichemical Review Process (SARP) reports from the vegetable industry, Patrick will capture direct input from growers relating to individual crop commodities, this input is then to be categorised by crop and region. The Project Coordinator will work in conjunction with Hort Innovation and regions Industry Development Officers (IDO's) and will engage and consult extensively with vegetable growers and other industry stakeholders.

Priority agrichemical gaps identified in this three-year project will inform industry actions at the annual AgChem Collaborative Forum, aid in updating industry SARPs and identify potential solutions to address these gaps.

The successful rollout of this project will result in an effective agrichemical prioritisation process for the vegetable industry through a high level of industry engagement and input, which will direct R&D funding for crop protection purposes.

By working together with growers the main goal of this project is to ensure a productive vegetable industry for generations, so keep an eye out for Patrick as he visits our vegetable growing regions and stay tuned for upcoming project consultation workshops.

For further information on the program contact the Project Coordinator – Agrichemical Pest Management Needs and Priorities, Patrick Arratia at patrick.arratia@ausveg.com or on 03 9882 6722.

Vegetable Agrichemical Pest Management Needs and Priorities (VG16060), a strategic levy investment under the Hort Innovation Vegetable Fund. The project's objective is to coordinate vegetable industry agrichemical pest needs by identifying and prioritising potential gaps through implementation of an effective prioritisation process for the vegetable industry.

Fact Sheet 3:

Appendix 2.3

Page 1:

THE HORTICULTURE CODE OF CONDUCT

National Vegetable Extension Network
SOUTH AUSTRALIA

What is the Hort Code?

If you're a farmer growing fruit or vegetables and sell through an agent or to a merchant, there's a law that says you must have a written contract. It's called the Horticulture Code of Conduct. The Horticulture Code is a mandatory code made under the Competition and Consumer Act and is enforced by the ACCC (Australian Competition and Consumer Commission). The Code aims to improve the clarity of trading arrangements between growers and traders (agents or merchants) in the horticulture sector.

The Horticulture Code of conduct is a law that orders fruit or vegetable growers to have a written contract (called a HPA) when selling their fresh produce to an agent or a merchant. The contract must have specific details regarding the agreement. An example is how price is calculated and when the seller will be paid. The code essentially has two roles, one is to make trading more transparent and the second is to deal with disputes if they occur. The Hort Code commenced across Australia 1 April 2018. The Code does not apply to transactions between Growers and: retailers, exporters, or processors. However, if a grower does sell produce through agents to retailers, exporters, or processors, the agreement between the grower and the agent is subject to the code.

HPA (Horticulture Produce Agreement)

Trading of horticultural produce between a grower and a trader can only take place if both parties have entered into a contract called a HPA. If trade does occur without a HPA, both trader and grower can face penalties. Traders can only trade as an agent OR a merchant under a single HPA and cannot trade as both. The HPA can only be in writing and can be accepted by either party with a signature or written notice (such as an email).

Record Keeping

Under the Code you must keep certain types of records for at least six years. Both parties must each keep a record on any HPA, any written notice of offer or acceptance and any written termination of a HPA. Traders must also keep any rejection notices and reason for rejection and statements for each reporting period.

Enforcement& Dispute Resolution

Breaches of a HPA requires penalty. ACCC has the right and obligation to carry out financial penalty and can issue infringement notices. If either party disagree over a HPA, issues can be resolved using any process either party would like to. Although, the code does have a dispute resolution process. If either party commences the dispute resolution process, both parties must participate in it. Parties must first try and resolve the dispute but if the dispute cannot be resolved after three weeks, either party can ask for a mediator. Costs for the mediation must be paid by each party equally (50%) plus the separate individual costs for each party unless another agreement is made. The Government has set up the Horticulture Mediation Advisor to assist with this specific process.

Breaches of contract

Penalties can be imposed if either party has breached any requirements of the code. Breaches can include but are not limited to; failing to deal in good faith, trader failing to advise grower of a rejection 24 hours after produce has been rejected, trader failing to share necessary information, refusing to attend mediation, failing to keep records as mentioned above. The ACCC can also issue any infringement notice where there is reasonable ground to consider that a person has breached certain provisions of the Code. If a person receives an infringement notice, it may be contested instead of paying the fine. If a contest of infringement occurs, the matter will be resolved in the court of law. Financial penalty of Hort Code can result in a fine up to $63,000 and infringement notices can be up to $10,500.

For more information

- ACCC Small business helpline: 1300 302 021
  accc.gov.au/agriculture
- Agriculture Info Network:
  accc.gov.au/media/subscriptions
- Free online education programs:
  accc.gov.au/ccaeducation

Page two:

QUY TẮC THỰC HÀNH NÔNG NGHIỆP

National Vegetable Extension Network
SOUTH AUSTRALIA

Quy tắc thực hành nông nghiệp là gì

Nếu quý vị là nông gia, trồng rau hay hoa quả và bán sản phẩm của mình thông qua đại lý hoặc người buôn hàng thì gần đây Chính phủ Úc đã ban hành một Luật quy định rằng, việc buôn bán đó phải được thực hiện bằng hợp đồng trên giấy tờ. Luật này, được gọi là Quy tắc thực hành nông nghiệp (Horticulture Code of Conduct). Việc tuân thủ Quy tắc này là Bắt buộc chiếu theo Luật Tiêu dùng và Cạnh tranh, cơ quan kiểm soát việc tuân thủ Quy tắc là ACCC (Viết tắt của Ủy ban về Tiêu dùng và Cạnh tranh Úc). Mục đích của bộ Quy tắc là nhằm cải thiện độ minh bạch trong các thỏa thuận mua bán giữa Nông gia với các Đại lý hoặc nhà buôn trong lĩnh vực nông nghiệp.

Theo quy đinh của Bộ quy tắc này, hoạt động mua bán giữa Nông gia và Nhà buôn bắt buộc phải có Hợp đồng trên giấy tờ (Gọi tắt là HPA). Nội dung của bản Hợp đồng này sẽ bao gồm các thông tin cụ thể liên quan tới hoạt động mua bán, sản phẩm, thời hạn thanh toán ... Ví dụ như giá sẽ được hai bên thống nhất tính như thế nào (giá cố định hay thỏa thuận theo thị trường, giá lấy đồ và giá trả về ...) hoặc trong khoảng thời gian nào thì người mua phải trả tiền cho người bán.

Bộ Quy tắc, như vậy, có hai mục đích chính, một là làm cho hoạt động mua bán rõ ràng minh bạch hơn, hai là sẽ tạo cơ chế để giải quyết khi quá trình mua bán phát sinh tranh chấp.

Bộ Quy tắc này được áp dục trên phạm vi Toàn quốc kể từ ngày 1 tháng 4 năm 2018. Phạm vi áp dụng của Bộ Quy tắc không bao gồm việc Nông gia bán trực tiếp cho người bán lẻ, bán cho xuất khẩu hoặc bán cho các nhà Chế biến, tuy nhiên, nếu Nông gia thông qua Đại lý để bán cho Bán lẻ, Xuất khẩu hoặc Chế biến, thì lại nằm trong phạm vi điều chỉnh của Bộ quy tắc.

Hợp đồng mua bán Nông sản (HPA)

Theo quy định của Bộ Quy tắc, hoạt động mua bán các sản phẩm Nông nghiệp diễn ra giữa Nông gia và Nhà buôn chỉ được xem là hợp pháp khi Hai bên cùng ký với nhau Bản hợp đồng mua bán Nông sản (Gọi tắt là HPA). Nếu hoạt động mua bán vẫn diễn ra khi chưa có Hợp đồng, hai bên Mua và Bán có thể sẽ bị Phạt. Với mỗi bản hợp đồng, bên Mua chỉ được đóng một trong hai vai trò, hoặc là Đại lý (đại diện cho người bán) hoặc là Nhà buôn (mua và bán lại Nông sản). Bản hợp đồng mua bán Nông sản phải được thể hiện trên Giấy tờ và được một trong hai bên mua hoặc bán Ký, hoặc thông báo đồng ý bằng Thư điện tử.

Lưu trữ

Theo quy định được ghi trong Bộ Quy tắc, các bên mua bán phải lưu trữ các giấy tờ liên quan tới hoạt động buôn bán của mình trong thời gian Tối thiểu là Sáu năm. Cả hai bên phải lưu trữ Hợp đồng, các Thông báo bằng văn bản về Báo giá và Đồng ý giá cả cũng như các thông báo về Hủy hợp đồng. Ngoài ra, bên Mua phải lưu giữ các bản từ chối nhận hàng và lý do từ chối nhận hàng.

Thực hiện và giải quyết tranh chấp

Việc vi phạm các Thỏa thuận ghi trong Hợp đồng mua bán sẽ dẫn tới các khoản phạt tiền liên quan tới hành vi này. Trong trường hợp một trong hai bên Mua hoặc Bán phát sinh tranh chấp liên quan tới HPA, các tranh chấp sẽ được giải quyết tùy theo đề nghị của một trong hai bên. Tuy nhiên, căn cứ vào Bộ quy tắc, thì việc giải quyết tranh chấp sẽ tuân thủ một quy trình nhất định. Theo đó, một khi một trong hai bên đã đệ trình việc giải quyết tranh chấp thì cả hai bên sẽ phải tuân thủ quy trình. Trong vòng ba tuần lễ, hai bên sẽ phải thỏa thuận hình thức và thủ tục giải quyết tranh chấp. Sau ba tuần, một trong hai bên có thể trưng cầu trọng tài. Phí tổn thuê trọng tài để giải quyết tranh chấp sau khi giải quyết, sẽ được chia đều cho hai bên. Chính phủ Australia đã thành lập Hội đồng trọng tài giải quyết tranh chấp trong lĩnh vực Nông nghiệp để giải quyết vấn đề này.

Không tuân thủ Bộ quy tắc

Trong trường hợp bên Mua hoặc bên Bán không tuân thủ các quy định của bộ Quy tắc này, phạt tiền sẽ được áp dụng.
Việc không tuân thủ quy tắc bao gồm (không hạn chế): Không tiến hành mua bán trung thực, Bên mua không báo cho bên bán về việc trả lại hàng trong vòng 24 tiếng, bên mua không cung cấp các thông tin cần thiết; từ chối tham gia giải quyết tranh chấp hoặc không tuân thủ việc lưu trữ tài liệu. ACCC là cơ quan có thẩm quyền ra thông báo phạt vi cảnh khi phát hiện các bên không tuân thủ quy định của Bộ Quy tắc. Một khi một bên đã nhận được thông báo về khoản phạt, bên đó có thể tìm kiếm trợ giúp pháp lý hoặc trả tiền phạt. Khi tiến hành tìm kiếm trợ giúp pháp lý để chống lại khoản phạt, vấn đề sẽ được giải quyết tại Tòa án. Theo Bộ quy tắc, các khoản phạt khi không tuân thủ có thể lên tới 63 ngàn Đô la, và ACCC có thẩm quyền ra thông báo phạt vi cảnh lên tới 10 ngàn 500 đô la.

Để biết thêm thông tin

- Đường dây nóng trợ giúp Doanh nghiệp Nhỏ của ACCC: Tổng đài 13000302021 Trang web: accc.gov.au/agriculture
- Mạng lưới thông tin Nông nghiệp accc.gov.au/media/subscriptions
- Chương trình hướng dẫn miễn phí trên mạng accc.gov.au/ccaeducaiton

Appendix 3: Case Studies and Narratives

Appendix 3.1

Case Study and Narrative 1:

Area	Comment
Date	9/04/2018
Submitted by	Jordan Brooke-Barnett, AUSVEG SA State Manager
Crop type	Cauliflower, Lettuce and Broccoli and value-added Cauliflower Rice product
Issue	Product Development
Stakeholder	Chris Musolino of T Musolino and Co, the largest field broccoli and cauliflower grower in South Australia
Engagement	Jordan Brooke-Barnett met with Chris Musolino to discuss product development opportunities for a cauliflower rice product. Chris has produced a cauliflower rice with 6 month shelf life which is packaged in a microwaveable bag. To assist with development of this project VegNET SA put Chris in touch with a number of state government researchers and linked Chris in to the national 'Veggycation' programme to assist in designing nutrient information panels for processed foods. Chris is interested in exporting and has engaged with levy-funded export training and initiatives and attended an AUSVEG SA trade mission to Singapore and Malaysia. Since participating in training and the mission, VegNET SA has conducted follow up with Chris to link him to key overseas buyers, link in with government services and help him initiate an export program. In addition, VegNET SA has also linked Chris into state government programs where he has been able to receive significant grants to support the purchase of new processing machinery and put him in touch with consultants who have helped him claim R&D tax incentives. This wholistic approach of linking Chris to both levy and non-levy funded investments through VegNET SA has led to a significant benefit within his business by supporting both his processing and export business development activities.
Reaction	Chris was not very engaged with Hort Innovation funded R&D when AUSVEG SA visited him around two years ago. Since engaging with VegNET SA he has been presented with a number of opportunities to improve his knowledge and access to assistance.
Actions	Chris was able to solve problems relating to the development of his value-added cauliflower rice product by linking with VegNET SA and levy funded research. In addition, AUSVEG SA was able to support him with knowledge of state government research and grants which he was able to access to develop the value-adding arm of the business. Through using both levy and non-levy initiatives, VegNET SA was also able to support Chris to move into export of his cauliflower rice product. As of today, Chris has significantly invested in processing machinery which will allow him to produce 20,000 cauliflower rice sachets a day. Chris has also developed export markets for his product and is now selling to supermarkets in Singapore and Malaysia.
Impacts	Chris was able to develop and effectively his new product with assistance from VegNET SA. Chris is now producing a considerable volume of the cauliflower rice product for domestic market. Chris is now exporting his product to Singapore and Malaysia.

Area	Comment
Issue	Chris Musolino of T Musolino and Co wanted assistance from VegNET SA in two key areas: • Assistance in finalising development of a new innovative value-added cauliflower product • Assistance in developing an export market for the product
Purpose	The goal of this project was to apply levy and non-levy funded R&D to assist a grower with product and market development in South Australia. The grower involved reached out to VegNET SA for assistance and it is a great example of how applied R&D can help a grower in their business. VegNET SA acted as an information broker in this case study to link the grower with information. The grower also benefitted from formal training run through the Hort Innovation-funded AUSVEG national export program. In this instance, VegNET SA was able to work closely with the grower to deliver his twin aims of developing the value-added product and establishing export markets in Singapore and Malaysia.
Context	VegNET SA worked with Chris Musolino of T Musolino over a number of years to apply latest R&D and knowledge to help him meet his business challenges. This is an important example of how academic research can be applied to business problems with programs like VegNET SA to apply and make research relevant to growers.
Activity	VegNET SA have worked with Chris over the past two years. A series of actions have been outlined below. ***Product development stage for cauliflower rice*** VegNET SA linked Chris with a number of local researchers and commercial providers to assist with the project. This included food technologists as the SARDI Waite Institute and commercial R&D companies such as SAFCOL. VegNET also provided Chris with key product development information such as how to prepare nutrient information panels and assisted him to access information through the “Veggycation” project. VegNET SA provided information on latest consumer convenience trends through levy-funded Nielsen reports and accessible commercial research. VegNET SA also provided top level assistance in interpreting and summarising commercial research trends. ***Export development market stage*** VegNET SA ran export training for South Australian growers in early 2016 which Chris was able to attend. VegNET SA linked Chris in with a South Australian Government trade mission and travelled with Chris to Singapore and Malaysia to establish buyer networks. VegNET SA assisted with follow up on export inquiries and put Chris in touch with service providers such as freight forwarders to assist him to get ready for export. ***General R&D assistance*** VegNET linked Chris with information on SA Government advanced manufacturing grants which have made a significant contribution to expanding his production. VegNET linked Chris with information on Federal R&D tax incentives which he is currently processing which will provide a 40% return on eligible R&D expenditure.

Outcome	VegNET SA provided key information which supported Chris through the process of developing a value-added product and expanding into export markets. We took a holistic process of linking Chris with both levy and non-levy funded R&D to achieve results for his business. As a result, Chris has been able to achieve his business development goals with support of the VegNET SA program. He is also now very engaged with the VegNET SA program and regularly attends R&D events.
Learning / reflection	Key lessons: • VegNET SA has significant success in extending R&D from multiple sources to a specific applied problem within a vegetable growing business. • We were able to build a strong working relationship by applying R&D to the specific problems facing the growers business. • VegNET SA was able to be a key partner in Chris Musolino's success, but this was only possible once trust was built due to the confidential nature of commercial issues. • VegNET SA had success in combining Hort Innovation funded R&D with state R&D and government programs like grants to help the business in this case study.
Figures	 http://healthyheartproduce.com.au/cauliflower-rice/

Case Study and Narrative 2:

Appendix 3.2

Area	Comment
Date	21/8/2017
Submitted by	Hannah McArdle
Crop type	Salad Leaf
Issue	Post-Harvest Management
Stakeholder	Anthony, a bunch line grower on the Adelaide Plains.
Engagement	Anthony attended a Post-Harvest Management workshop which focused on management systems to minimise disease risk, increase shelf life, reduce rejections from buyers and maximise sales.
Reaction	Anthony was unsure about the relevance of this workshop to his business and the time length (3 hours) but came along anyway. He has previously mentioned that he has had issues with ranging temperatures within a bin of products. He left the workshop with ideas to improve his business and was pleased that he attended.
Actions	Anthony altered the way he stored produce by creating new bins which allowed an increase in airflow to the produce in the bins, keeping the produce within a deviation of .2 degrees throughout.
Impacts	After one season, Anthony reports to have a decrease in buyer rejections of his Parsley and increase in parsley sales.

Area	Comment
Issue	Post-harvest storage of parsley on Anthony De Ieso's farm. The produce varies greatly in temperature throughout the produce storage bins and does not provide a consistent product to buyer and thus, is often rejected from the buyer.
Purpose	Prior to Anthony attending a Post-Harvest management workshop held in SA as part of the VegNET – SA project, Anthony was having issues with storage of parsley in bins on his farm which was discussed with the IDO of AUSVEG SA.
Context	Anthony attended the Post-Harvest Management workshop held at Thorndon Park Produce in August 2017 which was run by Dr Jenny Eckman and Adam Goldwater from Applied Horticulture Research (AHR). Anthony had fear with each sale of the parsley the business produced that it would be rejected from the buyer. Fixing this issue was important to Anthony as it caused loss of business from reduced sales of parsley.
Activity	After the workshop, Anthony designed and altered his parsley storage bins on his farm (see picture) with piping. This was to allow air flow into the bins so the temperatures within the bin remained consistent.
Outcome	The trial Anthony ran was successful and has since had fewer rejections for temperature. Anthony's business has now permanently changed the way they pack parsley as well as changing harvesting storage. Anthony also said that despite the addition of the piping in the bins, they are actually fitting more parsley in the bins than previously due to the increase in airflow.
Learning / reflection	Anthony has changed the way his business stores parsley and thus and said he will now participate in more events run by VegNET in SA. Anthony said that the cost effective measures created positive results for him and that by attending the workshop, it allowed him to think outside box.
Figures	 Above is a picture of the bin with the addition of the pipes that Anthony added.

Area	Comment
Date	16/10/18
Submitted by	Hannah McArdle
Crop type	Bunchlines
Issue	Issues with soil structure on bare patch of ground. Wanting to plant on the patch of ground.
Stakeholder	Anthony, a bunch line grower on the Adelaide Plains.
Engagement	Anthony attended a the Soilborne Disease Masterclass workshop which discussed many different aspects of Soilborne Disease and best soil practices and was ran by AHR and RMCG in Mawson Lakes 3 + 4 September this year.
Reaction	Anthony jumped at the idea of attending the workshop (2 days) due to previous success with other workshops. Anthony hoped he could leave the workshop with some ideas on planting in the said patch of ground.
Actions	Anthony provided a different method preparing to this said bare patch of ground. Instead of trying to grow on it without any preparation, he looked at soil structure and provided the area with organic matter (OM) using waste produce from the kale he grew.
Impacts	Within a matter of weeks, Anthony noticed that this area of land was now 'growable', there was an increase of worms and the drainage was improved as well as seeing an improvement in water use efficiency. Anthony then planted kale in this area. See figures for before and after photos.

Case Study and Narrative 3:

Appendix 3.3

Area	Comment
Issue	Issues with soil structure on bare patch of ground. Wanting to plant on the patch of ground but the soil quality is poor.
Purpose	Before Anthony attended the workshop, he had been looking into ways which can improve soil structure but couldn't find the answers he needed. He then spoke with the IDO of South Australia and they encouraged Anthony to attend an upcoming Soilborne Disease Masterclass.
Context	Anthony attended the Masterclass held in Mawson Lakes in September 2018 ran by RMCG and AHR. Anthony needed more space on the farm to grow and the only area he could use had poor soil quality and structure.
Activity	After the Masterclass, Anthony decided to improve his soil structure with the addition of organic matter to the soil surface, then chopping the OM into the soil. The OM Anthony used was also waste product from one of his bunch lines.
Outcome	The addition of OM improved the soil structure as well as drainage and water retention. Anthony could then plant kale on the area. See figures for before and after photos.
Learning / reflection	Anthony learnt from the workshop that soil health is just as important as the planting of crops. Anthony also learnt that it can be worthwhile to plant less crops and still achieve the same yields instead of overcropping and producing the same yield.

Figures

FIGURE 1: The area after the organic matter was added, before rotary hoe, notice lighter coloured soil

FIGURE 2: The area after the organic matter was added, after rotary hoe, notice deeper coloured soil

FIGURE 3: The area after kale was successfully planted and grown

FIGURE 4: Handful of soil containing worms the same day the picture in FIGURE 3 was taken

Case Study and Narrative 4:

Appendix 3.4

Area	Comment
Date	19/12/18
Submitted by	Thang Hoang Le & Tinh Lai
Crop type	Roma Tomatoes (greenhouse)
Issue	Worm activity is low in the soil
Stakeholder	Daniel Hoffman, a Tomato grower in Penfield, South Australia
Engagement	The 2 Vietnamese extension officers (VEO) engaged with Daniel regarding worm levels in his greenhouses and what his perception was of the worms in his soil. Through the SA IDO, the VEO's were introduced to Declan McDonald of SESL and Bill Grant of Blue environment who both were working on the Hort Innovation funded project, VG15037. A workshop on worms was held by AUSVEG SA and lead by Bill Grant at a farm in which Daniel attended.
Reaction	Daniel has always been interested in worms but wanted to know what other farms worm levels were and how to increase their numbers on his growing site so he attended the workshop.
Actions	After learning how Declan and Bill conducted their worm assessment, the VEO's repeated the method on Daniel's farm on 3 separate locations on the farm (growing rows, walkways and outside the greenhouses) to gain a total count of the current numbers of worms.
Impacts	After the workshop Daniel could identify different types of worms which he can now use as an indicator of how healthy his soil and growing conditions are. As a result of what Daniel learnt, he changed some management practices such as reduced tillage and cover cropping to break up compact soil to encourage more worms in his growing area. The cover crops Daniel uses now assist to create increased organic matter that also encourages worm activity. Daniel changed his fertilizer program to include a soil probiotic liquid to encourage more worm activity. Daniel's soil preparation for the season included worm casing pellets to slowly release nutrients.

Area	Comment
Issue	There is minimal information regarding worm activity, particularly worm activity in the Adelaide Plains, South Australia. Farmers in this particular region rely on fertilizers for soil condition and almost nothing regarding worms.
Purpose	Previous to this workshop, Daniel had used worms to understand more about his soil condition but he wanted to know even more about worm activity and learn what other farms in the area are doing to increase their worm activity on their farm. Daniel wanted to know if there was any other new methods of farming involving worms around Australia. He was keen to attend the 'Working with Earthworms' workshop to meet other growers and learn more about worms.
Context	Daniel attended the on-Farm workshop '*Working with Earthworms'* on 26th November 2018 in Hillier South Australia ran by Bill Grant of Blue Environment and organized by AUSVEG SA. Daniel wanted to increase worm activity to make sure that he had a healthy worm population after soil tillage at the beginning of his growing season.
Activity	After the workshop, Daniel incorporated a worm probiotics product with his fertilizer program at least once every 2 months. Daniel now has plans to use cover crops at the end of his season and reduce his tillage to minimise damage to his worm levels in his growing sites. Daniel also encourages other farmers to pay more attention to worms on their farms.
Outcome	By Daniel changing practice to encourage more worms in the greenhouses, it helped to increase drainage and increases microbial activity in the soil. The addition of the worm probiotic product used in Daniel's fertilizer program helped increase root growth and helped prevent some diseases which in turn lead to increased yields.
Learning /reflection	Daniel increased his knowledge on worms after the walkthrough event and now integrates worm monitoring with his growing operations. Monitoring the numbers of worms and ensuring the number is maintained in his soil provides additional benefits to his crops and helps to give him a good assessment of his soil health. Daniel now uses minimal fungicides through the irrigation and less dependent on chemicals. He is confident in his soil preparation at the beginning of his growing season. He is on track to maintaining excellent soil health for long term farming. Daniel also shares his learnings with other growers.
Figures	

Case Study/Narrative 5:

Appendix 3.5

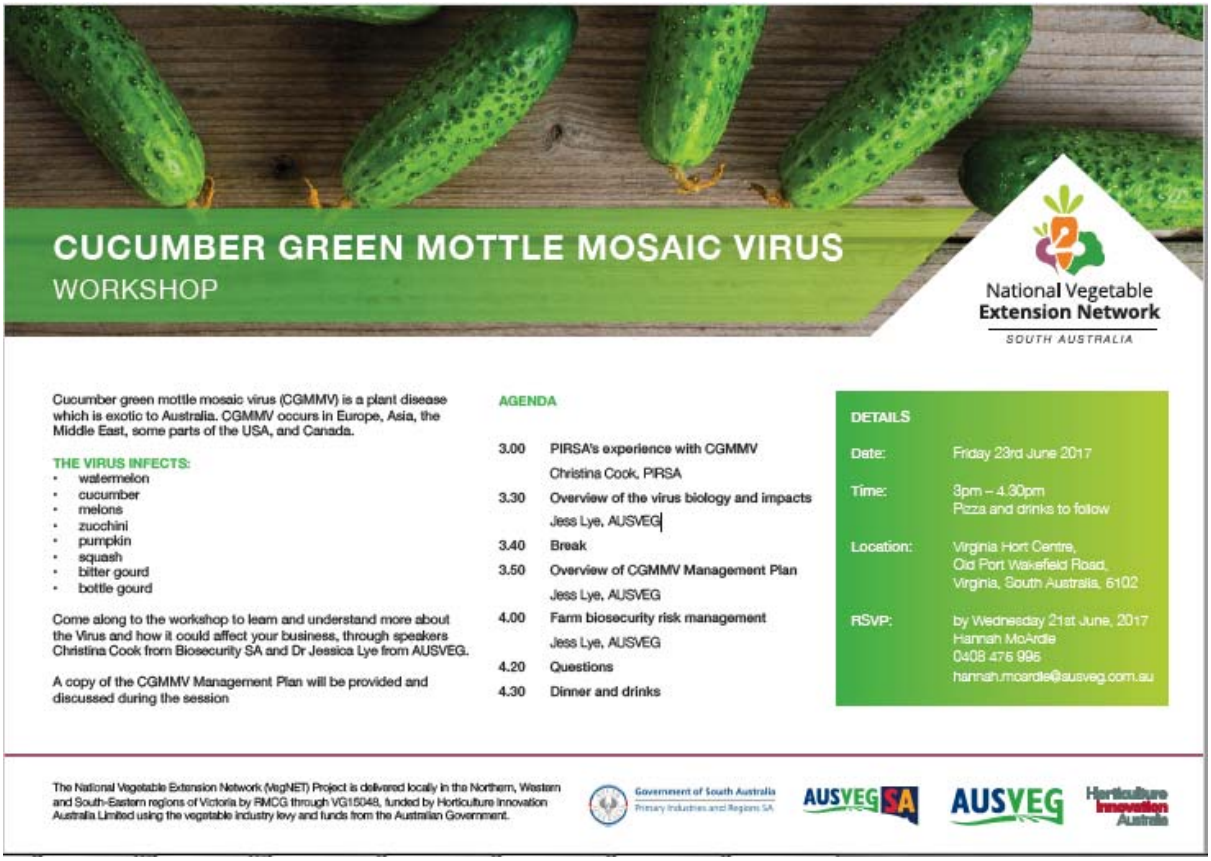
Area	Comment
Date	19/12/18
Submitted by	Hannah McArdle
Crop type	Capsicums (greenhouse)
Issue	Worm activity is low in the soil
Stakeholder	Kevin, a capsicum grower in the Adelaide Plains
Engagement	The SA IDO connected farmer Kevin with Declan McDonald from SESL who was looking for a site to set up a trial on worms in a greenhouse for Hort Innovation project (VG15037). Kevin had previously mentioned to the IDO that he had some issues in worm counts in his soil.
Reaction	Kevin was pleased to host a trial on his farm as he had mentioned he wanted to learn more about worms. Kevin had hoped that at the completion of the trial, he understood more about worms as well as there being an increase in worm numbers on his farm.
Actions	After the first sample was taken, Kevin used reduced tillage methods, added compost and increased his length of timing of irrigation. Kevin also education his family on worms and what some worms mean for soil health.
Impacts	Since the beginning of the trial, Kevin has used less fungicides and pays more attention to the level of worms in the soil. He has noticed that there has been an increase of worm numbers since the beginning. Kevin has also now increased awareness on the topic of worms in the Young Growers Group, particularly with young grower Daniel Hoffman.

Area	Comment
Issue	Kevin wanted to learn more about worms in soils so the SA IDO set him a meeting with Declan McDonald from SESL, who was looking for trial sites for the Hort Innovation project he is running on worms. A trial site was then established on Kevin's capsicum farm.
Purpose	Before the trial was set up, Kevin wanted to learn more about worms in his soil. Declan McDonald from SESL wanted to set up a trial on worms. SA IDO connected the two in 2016 and a trial was established.
Context	Kevin had a worm trial established on his property by Declan from SESL. Over the two years of the trial, Kevin monitored his soil for worms and learnt how to keep the soil healthy and worm numbers high.
Activity	During the trial, Kevin regularly monitored for worms and encouraged other farmers to do the same.
Outcome	Since the beginning of the trial, Kevin has used less fungicides and pays more attention to the level of worms in the soil. He has noticed that there has been an increase of worm numbers since the beginning. Kevin also now uses a 'worm promoting product' in his irrigation system on his soils.
Learning / reflection	Kevin has also now increased awareness on the topic of worms in the Young Growers Group, particularly with young grower Daniel Hoffman. Kevin also has and decrease in the dependence of using chemicals on his farm and can now identify different species of worms and their meaning of soil health.
Figures	

Appendix 4: Workshop Information

Appendix 4.1

Workshop Flyer example 1:



Workshop Flyer example 2:

TOMATO-POTATO PSYLLID
WORKSHOP

National Vegetable Extension Network
SOUTH AUSTRALIA

The tomato-potato psyllid (TPP), Bactericera cockerelli, is a tiny sap-sucking, winged insect that originates from North America and is one of the most destructive potato pests in the western hemisphere. The psyllid also feeding can lead to loss of plant vigor and yield. TPP was detected in Australia for the first time in February 2017, in metropolitan Perth, Western Australia. It has been decided that it is not technically feasible to eradicate TPP in Western Australia.

AFFECTED CROPS INCLUDE:

- potato
- tomato
- eggplant
- capsicum
- chilli
- tamarillo
- sweet potato

The psyllid is capable of transmitting zebra chip disease, which poses a threat to potato crops. The zebra chip bacterium has not been found in Western Australia.

Come along to the workshop to know more about TPP and its threat to SA!

AGENDA

12.00	Introduction Christina Cook, PIRSA
12.10	What if TPP arrives in SA? Christina Cook, PIRSA
12.20	Identification, Surveillance and Reporting Raylea Rowbottom, UTAS
12.40	Break
12.50	Lessons from WA and NZ Experiences Duncan McLeod, Seed & Field NZ and Callum Fletcher, AUSVEG
1.10	Risk Pathways and on Farm Biosecurity Callum Fletcher, AUSVEG

DETAILS

Date:	Tuesday 18 July 2017
Time:	12pm – 2pm Lunch provided
Location:	Virginia Hort Centre, Old Port Wakefield Road, Virginia, South Australia, 5102
RSVP:	by Friday 14 July, 2017 Hannah McArdle 0408 476 996 hannah.mcardle@ausveg.com.au

The National Vegetable Extension Network (VegNET) Project is delivered locally in the South Australia by AUSVEG SA through VG15045, funded by Horticulture Innovation Australia Limited using the vegetable industry levy and funds from the Australian Government.

AUSVEG SA
Representing South Australian vegetable and potato growers

2016

Regional Capacity Building Project

VG15100
The purpose of this project is to provide regional capacity building services for the South Australian Vegetable Industry

Monitoring & Evaluation Plan

SUMMARY:

The purpose of this project is to provide regional capacity building services for the South Australian Vegetable Industry. Key objectives of the project are:

To provide and deliver regional capacity building services to the vegetable industry in South Australia

To Increase knowledge of vegetable research and development (R&D) and facilitate the adoption of R&D by vegetable businesses across South Australia

To increase the reach of the vegetable R&D program by engaging stakeholders in the vegetable value chain and developing trusted networks at a regional level

To provide linkages to the national industry communications services (delivered by AUSVEG through VG15027, 'Vegetable industry communications').

Vegetable Industry– Strategic Investment Plan 2012-2017

This project contributes to the achievement of the Vegetable Industry Strategic Investment Plan 2012 – 2017 Objective:

Increasing industry knowledge of R&D investments and providing a supporting environment to regional capacity building projects which aim to increase knowledge, engagement and adoption of the vegetable R&D program

PROJECT APPROACH:

The aim of this project is to engage and educate South Australian vegetable growers on the outcomes of industry-funded R&D with confidence that growers participate and benefit from the project.

For this project to provide regional capacity building services for South Australian vegetable growers a number of goals will be set which will involve activities and outputs.

These include:

Annual work plans and set goals

Design of extension activities targeting information needs of the target audience

Identifying gaps in adoption of knowledge and practices resulting from the vegetable R&D program

Delivery of extension events

Communication and engagement with growers and industry stakeholders

Project evaluation and reporting

Context

Vegetable growing in the region is limited to the irrigated area. Rainfall is a limitation to vegetable growing. It is estimated that South Australia's vegetable value is in the area of $550 million per annum gross revenue.

Project Log Frame and Monitoring and Evaluation Framework

Project Name: **Regional capacity building to grow vegetable business in South Australia;**

Number: **VG15100** **Date Started**: 15/03/2016 **Completion date:** 31/03/2019

Evaluation Level	Project Details	Performance Measures	Evaluation Methods
Longer Term Benefits [which the project is contributing towards] Horticulture Innovation Australia Potential impacts on industry productivity, profitability, environmental and/or social benefits	Horticulture Innovation Objectives Vegetable Industry Strategic Investment Plan 2012 – 2017 objective: increasing industry knowledge of R&D investments and providing a supporting environment to regional capacity building projects which aim to increase knowledge, engagement and adoption of the vegetable R&D program Potential Long Term Impact Increased size, efficiency, sustainability and profitability in the vegetable industry Australian community recognises and is supportive of the contribution of the vegetable industry.	Extent to which vegetable growers are aware and supportive of R&D investments and the trend over time. Extent to which vegetable growers are engaged in capacity building activities and who access information and outputs. Extent to which the vegetable industry is growing, has increased efficiency and profitability. Extent to which community are aware and supportive of the vegetable industry.	[Not the responsibility of the funded project] National and regional industry surveys. Cumulative data from regional capacity building projects. Feedback from industry representatives. National and regional economic and production statistics for vegetable production. Community surveys and media analysis.
Project Impact [expected to be achieved in the life of the project] Extent of Awareness Gains in Knowledge and Skills Extent of practice change Indicative benefits Barriers and Enablers	Industry strengthening Strengthened networks and appreciation for significance of South Australia's vegetable industry Knowledge and Capacity gains Increased reach and knowledge of vegetable R&D, innovation and technology: 80% of all vegetable growers to be aware of the program and events and main messages being promoted in SA. 30% of AusVeg SA members better able to identify issues and opportunities and access information or resources to make appropriate changes. Practice change Increased adoption of improved practices and innovation: 15% of members across all industries adopt	Extent to which networks have been strengthened – in terms of stakeholder groups, roles and numbers. Extent to which vegetable growers in region are aware of current and recent relevant vegetable R&D, innovation and technology and main messages – compared to target. Number of growers and % by size of growers who have participated in capacity building activities and indicate a gain in their knowledge and ability to ID and address issues and opportunities. Number of growers by size and type of production who have adopted one or more improved practices compared to target.	Matrix showing extent of effective network in region – at commencement and completion of the project. Targeted grower telephone survey with questions relating to awareness, changes made and influence of project activities. Project records on activities and participation and feedback sheets from participants. Narratives capturing incidences of changes and indicative impacts. Case studies of farms having made changes with economic analysis.

Evaluation Level	Project Details	Performance Measures	Evaluation Methods
	one or more of the targeted management improvements/innovations. Indicative Impact The 50% of AusVeg SA members who make one or more of the targeted changes will have improved their business production by a minimum of 5%.	Evidence that growers who have made one or more changes have improved business production and the extent of that gain compared to target.	
Engagement [expected to be undertaken during the project] Communication activities Extension Activities – field days, farm visits	Communication Bi-monthly article in AusVeg SA newsletter Extension Delivery of 4 Annual Workshops/field days per year Assistance and participation in vegetable industry events Attendance at National Horticulture Convention Attendance at Trade Show Targeted one-on-one visits with vegetable producers (such as Vietnamese grower group) to assist with R&D uptake Participate in relevant industry and regional networking meetings Ongoing communication with growers and researchers via phone and email	Extent of distribution of newsletter and articles, awareness and value perceived by growers and their consultants. Number, type and topics of meetings, participation by consultants, value perceived and edit record keeping sheet Number, type and topics of workshops and field day, participation by growers – type, size – value perceived and use made of the information with survey Type of assistance and participation in vegetable industry events and networking meetings, extent of added value, reaction by participants and use made of information. Number and topics of one-one visits and extent to which these assisted uptake of R&D and facilitated change and edit meeting record Details of number, frequency, participants (including type and size), topics, process and perceived value of innovation learning groups and actions	Questions in annual grower survey on value and use of information provided. Project records on details and participants at events and meetings. Feedback sheets from participants in consultant update meetings. Feedback sheets from participants in workshops/field day. Annual structured feedback review with members of vegetable innovation learning group. Extension officer report on participation in industry and networking meetings.

Evaluation Level	Project Details	Performance Measures	Evaluation Methods
		and decisions resulting and edit meeting record Number of growers and researchers in regular communication (phone, email) recorded on database including production details	
Products [expected to be developed from the project] New/adapted technology New information products or packages New understanding or knowledge	Extension materials Grower friendly R&D information and project results 5 technical notes 3 simplified R&D reports on specific vegetables Project reports Annual Operating Plans MER Plan Updates to Hort Innovation 6 monthly milestone status reports Mid-term project review report Final report	Number and topics of extension materials, their accuracy, details of circulation/ requests, perceived user-friendliness and usefulness to growers and consultants. Extent to which planned reports are completed in relation to needs and timing and are at required detail and quality.	Project records on outputs, feedback from Hort Innovation; peer review of outputs. Questions in annual grower survey in relation to extension materials. Acceptance and feedback from Hort Innovation.
Development [undertaken during the project] On-farm trials and testing activities Development of extension or training packages	Provide feedback to Hort Innovation on R&D gaps and needs. The development of grower-friendly materials and reports from R&D outputs.	Extent and usefulness of feedback to Hort Innovation and extent of action taken. Number and type of materials and report re-writing and their approach.	Feedback from Hort Innovation on R&D gaps Project records of materials developed
Structures [planned to be used to undertake and advise the project] Project team – including producer members	Governance Link with Coordinating project Staffing: Extension Officer Organisation support staff	Type and extent of linking with the coordinating project. Engagement, role and time input from staff.	Interview feedback from linkage project leader. Interviews with project staff Interviews with Hort Innovation staff.

Evaluation Level	Project Details	Performance Measures	Evaluation Methods
Funds and in-kind		Type and adequacy of organisational support provided.	

M&E Action Plan

M&E Method [from Evaluation Methods column]	Purpose/Focus	Details	Responsibility and Timing
Surveys of initial visits to growers and post visit surveys (appendices A&B)	To capture extent of awareness, satisfaction, knowledge gains, changes made, influence of project activities, barriers and gaps.	This is a targeted short face-face survey of vegetable growers, asking questions needed for reporting and planning.	IDO responsible for the surveying and to be completed during initial visits on farm and after each visit
Narratives (Appendix c)	To capture observed/ known change in practice resulting from project activities in a structured way.	Narratives are short, structured observations detailing how growers/others participated in activities and then took action. They follow a set framework.	Project staff to capture these as they observe or learn about them over time and put them on the on-line M&E platform.
Case studies (Appendix D)	To provide a more in-depth analysis of changes made and their costs and benefits.	Case studies follow a similar framework to narratives but require a farm visit and gaining quantitative details for analysis.	Project leader to ensure that these are undertaken in the second and third year of the project – by staff members or subcontractor.
Feedback sheets – workshops, field days, consultant and farm visits (Appendix E)	To capture reactions, perceived value, gains in understanding, intentions to act and issues needing addressing.	Feedback sheets follow set structure to allow the key information to be captured. Relevant for workshops, post-farm visits and follow-ups.	Event/meeting organiser to be responsible for modifying feedback sheet for the purpose, and having these filled in an entered on the on-line M&E platform.
Interviews with staff, Hort Innovation staff, coordinating project leader	To gain feedback on what is working well, what needs attention, how well input is being given and acted on.	These will follow similar lines of questioning using a semi-structured format and summarised against main headings.	Project leader to organise – preferably using a non-team member to undertake the interviews.

OBJECTIVE OUTPUT TABLES:

Y = YEAR Q = QUARTER

Y1 = 2016

Y2 = 2017

Y3 = 2018

Y4 = 2019

Q1= January, February, March

Q2= April, May, June

Q3= July, August, September

Objective 1: To deliver regional capacity building services to the vegetable industry in South Australia and design communication and delivery strategies

Activities	**Outputs**	**DUE DATE**	**Assumptions**	**Applications**
Communicate with as many stakeholders as possible about the R&D adoption program	Registered interest of those involved (stakeholders)	Y1 Q3 –Q4	All of those that are AusVeg SA members are interested	Stakeholders participate and complete face to face survey
Research stakeholder attitudes regarding adoption of R&D	Surveys distributed to stakeholders via face to face meetings	Y2 Q3-Q4	Stakeholders receive the survey with no issues and is completed before the termination of meeting	Stakeholders participate and complete survey and return the completed result
Design appropriate communication and delivery strategies to ensure key stakeholders are informed of R&D	Meeting dates set for workshops and emails and letters regarding up to date information sent to growers	Y1 Q3 – Y4 Q1	Meeting dates set when majority of growers and researchers can attend	Communication with growers and researchers

Q4= October, November, December

Objective 2: Increase knowledge of vegetable R&D and facilitate the adoption of R&D by vegetable businesses in South Australia

Activities	Outputs	Due date	Assumptions	Applications
2.3 Hold meetings with all stakeholders to ensure the plan and method of communication and adoption is appropriate	Constructive feedback from stakeholders. Effective meetings and presentation talks	Y1 Q3 – Y4 Q2	Cooperation and positive feedback from growers and researchers.	A better under understanding about the R&D. Outline the benefits of R&D adoption to the stakeholders.

Objective 3: To increase the reach of the vegetable R&D program by engaging stakeholders in the vegetable value chain and developing trusted networks at a regional level

Activities	Outputs	Due date	Assumptions	Applications
3.1 Implement adoption methods	Identify willing partakers (growers and researchers)	Y1 Q3 – Y2 Q3	Stakeholders remain interested and participating for entire length of project	Distribute resources for R&D
3.2 Communicate to HIA as the program progresses	Report R&D adoption as the program progresses (6 monthly)	Y2 Q1 Y2 Q3 Y3 Q1	Adoption of R&D is expected to increase as the project progresses	Analysis and distribution of R&D uptake data to HIA as the program progresses
3.3 Assess whether there is a continued need for extension with uptake of R&D	Overall uptake of R&D during this program to be calculated and presented	Y4 Q2	Risk that some growers will remain in disagreement to uptake of R&D	Compare the final R&D uptake % to the initial R&D uptake % to calculate the proportion of growers adopting new R&D

Objective 4: To provide linkages to the national industry communications services (delivered by AUSVEG through VG15027, 'Vegetable Industry communications')				
Activities	**Outputs**	**Due date**	**Assumptions**	**Applications**
4.1 Assess R&D adoption	Survey results Number of attendees at seminars	Y1 Q3- Y4 Q2	Surveys provide accurate assessment of impact of R&D adoption Attendees are supportive of the adoption of R&D	Assess requirement for further R&D
4.2 Gather and respond to feedback from stakeholders to ensure satisfaction	Feedback from stakeholders Responses to feedback	Y2 Q3– Y3 Q1	There is a sufficient number of responses with valuable feedback	Review and analyze the effectiveness of the project and satisfaction of stakeholders
4.3 Analyze whether delivery of the project was effective and achieved desired levels of R&D uptake	Survey data finalized Estimated R&D uptake increase achieved	Y3 Q4- Y4 Q2	Surveys provide sufficient information for accurate adoption estimation	Compiling of sufficient and important data for program assessment
4.4 Report to HIA	Report of the program including level of success and possible improvements	Y4 Q2	Enough information collected to provide a thorough report	Important information for HIA and the public to see results of the program

EVALUATION AND MONITORING:

To determine if the project is effective, a benchmark is necessesary to establish to appropriately assess the adoption of R&D. An example of this would be a quantitative recording of the number of growers to successfully adopt R&D with positive outcomes relevant to the issue as stated initially by the grower. Another example would be the number of participants in events such as workshops. The goal set must be to increase the knowledge and adoption of R&D in South Australia to ensure successful outcomes.

Obtaining a community attitude (in regards to the horticulture industry) towards the R&D adoption impact would facilitate expert and local assistance in combating the issue. An entire community understanding of the project is vital, which can be achieved through communication, advertising and interactions with the horticulture community to convey project objective, actions, events, and improvements for a more sustainable agricultural practice. The reason for adoption of R&D is only effective if horticultural practices can be improved as a result of the increase in adoption of R&D to grow South Australian vegetable businesses. The adoption must be relatable to the impact it has upon the businesses and surrounding environments. To measure the successfulness, the uptake in R&D adoption can be measured and the percentage at which the uptake of R&D of growers is compared to the percentage of what is aimed for.

Careful analysis of the success in a certain area can contribute a suggested plan outline that could be effective in other areas. Adaptions can be made to have the program better cater for the effective adoption of R&D. Communication with the community reporting the changes, adaption, results and overall proceedings of the program will better facilitate an effective execution of the adoption of R&D program.

Appendix 6: Media Releases

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AUSVEG SA
Representing South Australian vegetable and potato growers

National Vegetable Extension Network

17 October 2016 **Media Release – For immediate release**

Leading soil health expert to assist SA flood affected growers

Tasmanian soil scientist Dr Doris Blaesing will visit South Australian vegetable farms tomorrow to explain how growers can restore their soils and manage potential diseases following the recent floods to hit the state.

Dr Blaesing, from RM Consulting Group (RMCG), will speak to growers at two Soil Borne Disease Workshops held through the National Vegetable Extension Network, a program commissioned by Horticulture Innovation Australia (Hort Innovation) to communicate R&D information to growers through regionally-based extension programs.

The first workshop will be held on Tuesday 18 October at Mount Barker from 10:00am to 11:30am and the second workshop will be held at Gawler River from 3:00pm to 4:30pm.

"Doris is a champion of soil health and she has invested a significant amount of time visiting farms across Australia and talking to growers about the importance of soil in the productivity and efficiency of crop growth," said AUSVEG SA State Manager Jordan Brooke-Barnett.

"Vegetable growers throughout South Australia, particularly those in the state's northern growing regions, are recovering from the damaging weather and floods which have caused over $50 million worth of damage."

"It is a critical time for vegetable growers to put the appropriate procedures in place to restore the health of their soils and maximise the productivity of future crops, as well as negate the threat of potentially damaging diseases developing as a result of the floods and severe weather."

"Doris is currently leading Soil Wealth, a project which is also funded through Hort Innovation using vegetable levies and funds from the Australian Government. This project provides vegetable growers around Australia with practical information on soil management to help them get the most out of their crops and achieve long-term returns. Her knowledge in this

AUSVEG SA is the leading body representing the interests of vegetable producers in the state and provides growers with a united voice and strong representation with all levels of government.

This initiative follows the announcement that AUSVEG SA, the South Australian Produce Market and the Horticulture Coalition of SA have teamed up to establish the SA Growers Flood Appeal to rally support for local horticulture growers affected by the recent floods and wild weather.

The Appeal will fund seedlings and other startup costs for affected growers so they can get back on their feet, with funds administered by registered charity Foodbank. Applications for financial assistance will be assessed by an independent panel of growers and industry members.

"We have received over $60,000 so far for flood affected growers and we are extremely grateful for these donations. We hope that the opportunity to speak to Doris about soil restoration and disease management will help our growers get back on their feet as soon as possible," said Mr Brooke-Barnett.

Contributions to the appeal can be made at www.foodbank.org.au/donate-online or by calling (08) 8349 4493.

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Phone: (08) 8221 5220, Mobile: 0404 772 308, Email: jordan.brooke-barnett@ausveg.com.au

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Appendix 7: Vegetables Australia Magazine Updates

EXTENSION UPDATES: NORTHERN TERRITORY AND SOUTH AUSTRALIA

In this edition, the National Vegetable Extension Network (VegNET) examines the importance of bio-refuge barriers for Integrated Pest Management in the Top End, while VegNET SA has a new home and is looking ahead to another productive year. VegNET is a strategic levy investment under the Hort Innovation Vegetable Fund.

NORTHERN TERRITORY

Why in the Northern Territory are we spending so much time on our Banna grass windbreaks and bio-refuges?

That's something we ask a lot when we're out in the heat of the NT wet season, with the humidity building just before a monsoonal downpour. Establishing the barrier grass is hot and sweaty work in the wet, but the perfect weather for bugs to flourish.

What we've learnt thus far is that these refuges are an essential part of our Integrated Pest Management (IPM) program in more ways than one. Bio-refuges are the critical link in the chain to the IPM program being developed by VegNET NT. Often the crops are grown in fully cleared paddocks that have no permanent diverse vegetation nearby to act as a source or home to beneficial organisms.

Providing a functioning eco system in a metre-wide row provides a sanctuary that allows beneficial bugs and general predators, such as spiders and frogs, to flourish. What VegNET has found is that the Northern Territory already has a wide range of beneficial organisms in the environment.

The trick is to have enough of them in close proximity to the crop when they are needed. Hoverfly and ladybirds are excellent examples of this – they build up in numbers on the maize aphid, which is not a pest of most vegetables, but is found in these tropical grasses. These predators are then present in substantial numbers when other pest aphids try to establish themselves in the vegetable crops.

AN IMPORTANT BARRIER

The barrier grass row serves as a filter where the windborne pests land and a majority are taken out by these beneficial bugs before they can have any substantial impact on the crop being grown.

The Banna grass has other benefits as a wind break, reducing wind damage and evapotranspiration from the dry south easterlies that blow through the Top End growing season.

They protect against over-spraying from other crops nearby and spray drift carried by the wind from neighbouring properties.

Why Banna grass? Because it's very easy to establish. To produce runners, just add water and it will shoot from any of the nodes. Once established, management is relatively low: just slash beside it and run a mower over the row at 50 centimetres once a year to maintain the ideal height. It grows just as vigorously as most weeds do in the Top End and the torrential monsoonal downpours don't hold it back.

The hardest argument of all is to convince farmers that these rows of tall – sometimes a little untidy – cane grasses are not a cost or a waste of space, but a critical tool in best practice management for the Top End vegetable farming.

HOW TO KEEP IN TOUCH:

- Industry Development Officer: Laura Cunningham, 08 8983 3233 or ido@ntfarmers.org.au
- Facebook: facebook.com/NTFarmersAssociation
- Online: ntfarmers.org.au

SOUTH AUSTRALIA: NEW BEGINNINGS

It's been a fresh start among the fresh veggies at the South Australia Produce Markets in Pooraka for the team at AUSVEG SA this year.

"We moved our office from the Adelaide CBD in December and it's been a success in so many ways," VegNET South Australia Industry Development Officer (IDO) Hannah McArdle said.

"Now we are easily accessible to growers and it has been great to see so many more people attending our workshops."

Some of the most well-attended workshops have featured AUSVEG National Manager – Science and Extension Dr Jessica Lye, who provided participants with a greater understanding of the threat of the incursion of cucumber green mottle mosaic virus (CGMMV), and a management plan to tackle the plant pest.

To prepare for another serious biosecurity threat, the tomato potato psyllid (TPP), VegNET SA held successful workshops and information sessions to help South Australian vegetable growers understand the threat and management of this tiny sap-sucking, winged insect that affects capsicum, chilli and eggplant crops.

The Postharvest Roadshow with Dr Jenny Ekman and Adam Goldwater from Applied Horticultural Research (AHR) was another winner. Over 40 people at several venues enjoyed and benefited from the exchange of ideas on diverse topics, from cooling systems to the physiology of a zucchini.

"We are working closely with Sophie Lapsley from VegPRO, the national vegetable training initiative, to ensure our vegetable growers are receiving the training and information they want," Hannah said.

Growers can look forward to an irrigation workshop in May and the renowned VegInnovations (for value-adding to vegetables) workshop, which is scheduled for August.

To sign up for events, or hear more about VegNET in South Australia, please contact Industry Development Officer Hannah McArdle:

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INFO: