

## **Final Report**

# **Facilitating Adoption of IPM Through a Participatory Approach with Local Advisors and Industry (Coordination Component)**

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**Project code:**

VG15035

**Project:**

Facilitating Adoption of IPM Through a Participatory Approach with Local Advisors and Industry (Coordination Component) – VG15035

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## Summary

This Australia-first project involved a collaboration between AUSVEG SA, leading Integrated Pest Management (IPM) advisory company IPM Technologies and Hort Innovation to deliver an applied program to facilitate the adoption of IPM in the South Australian vegetable industry. This project had an innovative approach in that AUSVEG SA and IPM Technologies partnered to train horticultural resellers and advisors throughout the state to apply IPM management techniques with their client growers. This approach differed from previous programs which had targeted training for growers but not involved advisors. The project has been highly successful with over 30 growers trialing or transitioning their properties to IPM production techniques which have significant benefits in ensuring more efficient use of farm inputs and more effective resistance management for participating growers. AUSVEG SA's role in the project has been to coordinate and communicate with commercial partners and growers to ensure engagement with the project and work closely with IPM Technologies to support the roll out of technical services such as training and ongoing IPM advice.

In summary, the methodology of this project involved coordination of initial training with growers and advisors combined with follow up provided by IPM Technologies. The approach has been highly-successful as this approach of training advisors and providing ongoing support has taken the risk out of adopting IPM techniques with their client growers. In the past IPM workshops have been held for growers where they are provided with relevant information, however, when they return to their properties they have been hesitant to risk changes to their production systems and crops worth hundreds of thousands of dollars. In addition, advisors such as reseller agronomists have not been engaged with in the past and supported with ongoing assistance. This project has sought to overcome these issues by engaging both advisors and partner growers as well as providing ongoing assistance to overcome this hesitation to implement IPM.

The results of this project in South Australia have been significant, with over 30 trials implemented over the three years of the project. In addition, all of the advisors and companies providing agronomic advice for vegetables in the state have been trained with four of these companies adopting IPM advice in their ongoing work with growers. The project has engaged with growers across a number of commodities and growing situations (field and protected cropping) and achieved significant success in areas such as field brassica production where over 70% of the total state production is now under an IPM production system. AUSVEG SA has captured a number of these success stories in communications outputs produced throughout the project such as case study videos.

AUSVEG SA and IPM Technologies consider this project to have far exceeded our expectations in terms of grower and advisor engagement. The project has transformed the way that IPM advice is delivered in South Australia and had a significant impact in terms of practice change in the state. We consider the approach taken by this project to have been highly-successful and there is strong potential for this model to be adapted and delivered in future projects focused on practice change in our industry.

## Keywords

**IPM** – Integrated pest management. A method of production which involves targeted use of cultural controls, biological practices such as monitoring and use of naturally occurring beneficials along with use of chemistry to support where necessary. IPM production is a substitute for broad scale spray programs and has a number of benefits for growers including more effective resistance management.

**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.

**IPM Technologies** – IPM Technologies are an Australia-leading IPM consultancy who regularly advise growers and advisors on how to implement IPM production systems on farm. IPM Technologies were a partner in this project providing training and ongoing technical support to growers and advisors.

**Cultural controls** - Use of non-chemical or biological controls such as weeding, farm hygiene, crop rotation, sequential planting, soil management and variety selection as a basis of pest and disease management.

**IPM plan** – A formal strategy incorporating a strategic spray regime, cultural controls, pest monitoring strategy and beneficial releases which contribute to management of a crop under IPM production.

**Beneficials** – Beneficial predatory insects and mites and parasitoid insects which either occur naturally or are bred and released into a crop to control pest issues.

## Introduction

This project was collaboratively developed and delivered by AUSVEG SA and IPM Technologies in order to strategically and effectively increase the adoption and uptake of IPM production practices in South Australia. The project used a unique approach in that it focused on targeting training towards horticultural advisors and resellers rather than only growers. As part of the project, AUSVEG SA and IPM Technologies arranged and delivered a training package delivered to horticultural advisors in South Australia dealing with vegetables. As a result of this project, all major agronomy and reseller firms advising the South Australian vegetable industry received this training.

AUSVEG SA then worked to deliver follow up communications with the broader industry and growers to build interest in the program and assist the advisors and resellers to be connected to growers interested in conducting trials. This included ongoing communications with growers and industry members to increase awareness of the program, development of materials such as video case studies and delivery of events such as field days. AUSVEG SA provided a support role to IPM Technologies as part of this project where we utilized our networks and contacts with growers to assist with the delivery of technical training and other aspects of the project.

The rationale behind this project was to improve uptake of IPM practices by adopting a model where resellers and advisors, not just growers, were trained and supported to implement IPM practices. Prior to this project there had been significant research conducted into IPM but inconsistent adoption of practice change throughout Australia. Previous training programs had been run with growers, however, did not usually involve resellers and advisors or provide ongoing follow up afterwards. The problem with this approach was that growers were hesitant to change their production system after training due to significant risk. This project successfully overcame these perceived risks in two ways; 1) training was directed at resellers and advisors providing advice to the growers which provided additional support to growers participating in trials due to having a trained agronomist on hand to implement change; and 2) IPM technologies provided ongoing support to growers and agronomists throughout the duration of this project allowing a point of contact for ongoing questions. As a result of this approach, this project has been able to achieve strong practice change in South Australia, with over 30 growers trialling IPM as part of this project and all major resellers and advisors specializing in vegetable production receiving training and participating in trials as part of this project.

This project is significant for the vegetable industry as it is the first time this new approach to extension has been attempted. The significant successes of this project show that by training resellers and advisors and providing ongoing support is an effective way of driving practice change to production practices in our industry. As such this project has left a strong legacy in South Australia and provides a strong model for how future levy funded extension projects could work.

## Methodology

The project was developed and delivered using the methodology below which was jointly developed and proposed by AUSVEG SA and IPM Technologies.

### Approach:

This project had a strong focus on delivering applied training and support to advisors to support the implementation of IPM with their client growers. Advisors and a number of their key grower clients received training in IPM production systems then were supported on an ongoing basis to implement IPM production trials on their properties. The objective of this project was to provide a strong initial grounding in IPM production systems through training, but to also back that up with strong ongoing support over the project's three year duration to assist with practical issues and decision making to assist participating resellers and growers to successfully implement IPM on their properties.

As part of the project AUSVEG SA and IPM Technologies ran a number of theory training sessions for advisors in the first two years of the project. During this period all of the key reseller advisors and independent agronomists specializing in vegetable production in the state were successfully inducted into the project and received initial training. Furthermore, all of the participating advisors then initiated trials as part of the project finalizing successful trials with multiple clients.

IPM technologies then provided ongoing support to each participating advisor, acting as a key point of contact for ongoing questions and decision making. At the start of the project, AUSVEG SA and IPM Technologies had the goal of engaging with advisors servicing at least three key regions. As outlined in the list of trials and advisors contained in the outputs section of this report, the project has achieved strong coverage of each of the main reseller companies dealing with vegetables in the state (EE Muir and Sons, Elders, DJ's Grower Services, CRT Virginia) and key growing regions (Northern Adelaide Plains, Riverland, Adelaide Hills, Murraylands). In addition, the project achieved strong coverage of crop types and growing methods such as protected cropping and field production.

As part of this project, IPM Technologies provided training and backup for growers, while AUSVEG SA provided on the ground support in connecting with growers and resellers and building awareness of the project.

### Year 1: Launch of project

The first year of the project involved engaging with the initial advisors and growers participating in the project. During the initial phase AUSVEG SA and IPM Technologies worked together to identify project partners and deliver the first phase of training under the program.

#### Activities included:

- Assisting IPM Technologies to develop the framework for chemical reseller training over three years.
- Assisting IPM Technologies to develop the structure of training days.
- Identifying regions to undertake initial training days with chemical resellers and advisors.
- Identifying commercial partners in regions where training will take place.
- Developing a communications plan to raise awareness about the project, dissemination of training materials to trainees and facilitate organisation of workshops.
- Assisting the project M&E provider to develop a long-term strategy to measure changes in advice from chemical resellers to growers.
- Assisting the project M&E provider to develop a long-term strategy to measure grower uptake of IPM practices as a result of the program.
- Developing information materials, such as fact sheets, that chemical service providers may supply to interested growers.
- Completion of initial training days and a follow up training days in each region.

Year 1 also included a benchmarking study, carried out by IPM Technologies, to identify the level of IPM practice carried out in each region.

### **Year 2: Continuation of the project**

The second year of the project expanded on the work conducted in Year 1 by increasing the coverage and trials under the program. AUSVEG SA was actively involved in communicating and promoting the program to industry, including project case studies and in recruiting growers and advisors to participate in the second year of the project.

By the end of year two of the project, IPM Technologies and AUSVEG SA achieved coverage of all major advisors covering vegetables in the state and all production regions.

In the second year of the project, AUSVEG SA supported IPM Technologies by assisting with delivery of training events, recruiting advisors and growers, distributing communications materials on the project to industry and collecting data for M&E and benchmarking activities.

As part of the project mid-term review conducted with Hort Innovation it was agreed that the focus of the project would be adapted slightly in year three of the project to focus on achieving as many trials as possible. This was largely due to the fact that the project had achieved its goals of engaging with resellers by the end of year 2.

The final year of the project was therefore focused on engaging with as many growers as possible and providing participating advisors with the opportunity to hone their skills with as many growers and crops as possible to ensure the project left a strong legacy of practice change in the state.

### **Year 3: Validation and finalisation of the project**

As the project achieved such strong uptake by Year 2, the focus of Year 3 changed to ensuring the project achieved the maximum uptake possible within the South Australian industry.

In the final year of the project, AUSVEG SA worked with participating advisors and IPM Technologies to deliver two field days to increase interest in the program. In addition, AUSVEG SA developed a series of video case studies to showcase the successes of the project to industry and benefits of implementing IPM. The object of these videos was to showcase the benefits of IPM to encourage interested growers to look at implementing production practices as well as provide a record of the success of the project as an industry investment by Hort Innovation on behalf of vegetable growers.

In addition, after discussion with IPM Technologies and Hort Innovation, AUSVEG SA arranged for a specialized training module to be delivered to Government on-farm advisors such as biosecurity, field agricultural and natural resource management staff. As a result of the training, IPM Technologies and AUSVEG SA were able to build capability and knowledge with these advisors.



## Outputs

### IPM trials

Since project inception, there have been 30 active trials set up throughout South Australia, with a further 5 growers inducted into the project but with trials yet to be established.

From conversations with resellers, the recent Field Walk for greenhouse growers is expected to yield a few further trials before the project is finalised with protected cropping growers.

### Demonstration sites established in Year 1

Demo site	Location	Trial crop(s)
1	Currency Creek	Head lettuce, broccolini & cabbage
2	Virginia	Continental cucumbers*
3	Penfield	Capsicums & tomatoes*
4	Penfield Gardens	Broccoli, cauliflower, tomatoes, zucchini, beetroot & silverbeet
5	Virginia	Cauliflower, cabbage, kale & carrots

\* Protected cropping

### Demonstration sites established in Year 2

Demo site	Location	Trial crop(s)
6	Mount Barker	Brussels sprouts
7	Langhorne Creek	Brussels sprouts
8	Nairne	Brussels sprouts
9	Langhorne Creek	Brussels sprouts
10	Mount Compass	Hydroponic Asian greens*
11	Virginia	Broccoli
12	Virginia	Daikon radish, swedes & turnips
13	Naracoorte	Daikon radish, swedes & turnips
14	Virginia	Hydroponic lettuce & herbs*
15	Virginia	Cauliflower
16	Virginia	Broccoli, kale & tomatoes
17	Lewiston	Bok choy
18	Middle Beach	Head lettuce, zucchini & tomatoes**

\* Protected cropping; \*\*Certified organic

### Demonstration sites established (or pending establishment) in Year 3

Demo site	Location	Trial crop(s)
19	Virginia	Carrots
20	Waikerie	Cucumbers & capsicums
21	Port Gawler	Cauliflower
22	Port Gawler	Cabbage
23	Virginia	Celery, leeks & celeriac
24	Burton	Broccoli, parsnips, kale, & tomatoes
25	Burton	Head lettuce
26	Virginia	Chinese cabbage
27	Virginia	Hydroponic lettuce & herbs*
28	Virginia	Brassicas & tomatoes*
29	Virginia	Brassicas
30	Virginia	Capsicums*
Trial pending	Virginia	Capsicums*
Trial pending	Virginia	Capsicums*
Trial pending	Burton	Hydroponic lettuce, Asian greens & herbs*
Trial pending	Virginia	Celery
Trial pending	Virginia	Head lettuce
Trial pending	Virginia	Broccoli
Trial pending	Murray Bridge	Broccoli & head lettuce

\* Protected cropping

#### Communications and extension outputs

The following section details all the communications and extension materials produced throughout this project by AUSVEG SA in collaboration with IPM technologies. These resources are potentially applicable to future extension projects in the IPM space so may be useful to researchers and industry service providers in the future.

#### Newsletter articles

AUSVEG SA produced a large number of newsletter articles as well as a number of Media Releases throughout the project to inform industry of key project developments and support uptake of trials under the program. The newsletter articles produced throughout the project are included at **Appendix 1** and Media Releases at **Appendix 2**

#### Fact sheets

A number of fact sheets (**Appendix 3**) were developed throughout this project. These were distributed electronically via the AUSVEG SA database (c=850) as well as distributed physically at resellers and via participating advisors.

### Case Studies

A number of case studies were produced throughout this project to showcase the successes of participating growers and advisors. A selection of these is included at **Appendix 4**.

### Media Articles

The project featured in a number of media stories over the past years, with samples of coverage included at **Appendix 5**.

### Communications strategy

AUSVEG SA developed and delivered a communications strategy as part of this project to assist with the engagement of growers, resellers and other parties such as government staff. A copy of the strategy is included at **Appendix 6**.

### Video case studies

AUSVEG SA developed a series of video case studies as part of this project to showcase the overall achievements of the project and to provide two in depth case studies of participating growers.

The objective was to capture the significant accomplishments of IPM technologies, the participating advisors and growers throughout the project and highlight individual growers who had succeeded in implementing an IPM production system as part of the project.

### Project overview

The project overview video showcases how growers, industry advisors, IPM Technologies and AUSVEG SA worked together to effectively change grower practices and improve uptake of IPM in the South Australian vegetable industry.

**Click here** to view the video

### Case Study 1: Paul Musolino of T Musolino and Co

Paul Musolino effectively implemented IPM across a number of his commercial-scale cauliflower, broccoli and head lettuce crops. In this video Paul and his supporting advisors CRT Virginia provide an overview of the trial as well as their experiences with the project, the changes they made and benefits from adopting IPM production practices.

**Click here** to view the video



### **Case Study 2: Graeme Pitchford of Pitchford Produce**

Graeme Pitchford of Pitchford Produce at Currency Creek has long been a leader in sustainable production. As part of the IPM program he transitioned his entire farm to IPM production in partnership with IPM Technologies and Nigel Dolenc at EE Muir & Sons. In this video Graeme details his experience in transitioning to IPM on his commercial scale vegetable farm as well as the benefits to his business from participating in the project.

**Click here** to view the video

### **Distribution**

AUSVEG SA has distributed these using our electronic newsletter (c=850) as well as to key decision makers in government and NRM boards. In addition, we arranged for the videos to be distributed nationally to the AUSVEG Weekly Update list and hosted on the Integrated Crop Protection project website.

AUSVEG SA will continue to use these videos as a resource and look for opportunities to distribute them further as opportunities arise.

### **Field days**

AUSVEG SA held two successful field days in early and late 2018 in order to promote the key results of the project and encourage growers to participate in the final year. These events were important to provide ‘proof of concept’ for South Australian growers and both events resulted in a number of growers participating in trials as a result through the participating resellers.

#### **Field day 1. Field Brassica Field Day February 2018**

AUSVEG SA held a highly successful field day in early 2018 in conjunction with resellers participating in the project in order to highlight the success of recent trials. The field day was held on the property of Paul Musolino and T Musolino & Co and offered the opportunity for around 50 growers and industry members to see a successful trial first-hand. Participating resellers, IPM Technologies and Paul all gave presentations and took growers around the trial. The Field Day received positive feedback from participating advisors and generated interest from six new growers.



AUSVEG SA will again look to hold another field day towards the end of the project to support participating advisors to bring growers into IPM production after the project concludes. This is to support advisors who have invested significantly in their business to build IPM capability and ensure the project has the greatest success of leaving a lasting legacy of practice change beyond the project.

### **Field day 2. Greenhouse Field Day November 2018**

AUSVEG SA held a highly successful field day in early November 2018 in conjunction with resellers participating in the project in order to highlight the success of recent trials. The field day was held on the property of Daniel Hoffman, a Northern Adelaide Plains greenhouse grower, and offered the opportunity for 24 growers and industry members to see a successful trial first-hand. The objective was to engage with local greenhouse producers, particularly in the Vietnamese community, to show them how IPM could be implemented at low cost and with a strong emphasis on cultural controls.

As a result of the Field Day a further 5 growers have indicated interest in establishing trials in the final phase of the project.

The final IPM Field Day built on previous work AUSVEG SA has conducted with the Vietnamese growers through VegNET SA in providing quality assurance training for non-english speaking growers. As a result of the training there was significant interest in learning about low spray and sustainable growing techniques due to this heightened awareness around safety of chemical application. This field day was timed around one month after the VegNET SA training and received significant interest from these growers due to the heightened focus on managing spray applications. In addition, larger growers such as Perfection Fresh sent key growers to the trial, as they are currently investigating ways to integrate IPM production practices into their large-scale greenhouse at Two Wells.



*Daniel Hoffman showcasing his IPM production systems to local growers at the second IPM Field Day in November 2018*

Participating resellers, IPM Technologies and Daniel Hoffman all gave presentations and took growers around the trial. Daniel highlighted the Integrated Pest Management techniques he had adopted on farm such as strong use of cultural controls (e.g. weed management) and use of cover crops rather than fumigation during fallow periods to retain populations of beneficials. He has also adopted a number of innovative approaches such as planting bitter melons around his property to allow him to maintain strong populations of beneficials. Daniel commented that his production system was extremely low input with extremely limited chemical and fertiliser use. A number of the growers were interested to see this innovative production system and AUSVEG SA and IPM Technologies conducted an extensive Q&A utilising the expertise of resellers and other advisors on-hand to answer grower questions. At the end of the event a number of growers were referred to resellers to initiate trials and AUSVEG SA has shared the details of growers interested in establishing trials with participating resellers in the region. The Field Day received positive feedback from participating advisors and was successful in generating interest for final trials as part of the project.

## Theory training sessions

### Report on year one theory training

A total of 31 industry representatives and growers participated in the initial Theory Day training in late August 2016. In addition, IPM Technologies followed up with each of the participating main reseller companies and their participating growers to conduct a field training workshop to set up a number of trial sites throughout South Australia.

#### Event evaluation and feedback

Evaluation forms were collected from all attendees at each event. In addition, AUSVEG SA and IPM Technologies completed an event observation form for each training event.

1. Breakdown of participants:



FIGURE 1: Total number of participants for all workshops

2. Description of what was covered during the training events

- Explanation of general IPM concepts
- Introduction to different types of beneficials and their identification using live samples
- Explanation of cultural controls and their use in vegetable production
- Identification of chemical controls which can be used in an IPM strategy
- Explanation of one to two top level IPM strategies for potential use by the resellers and participating growers

3. What were the participants' levels of awareness/knowledge/confidence in IPM at the start of training?

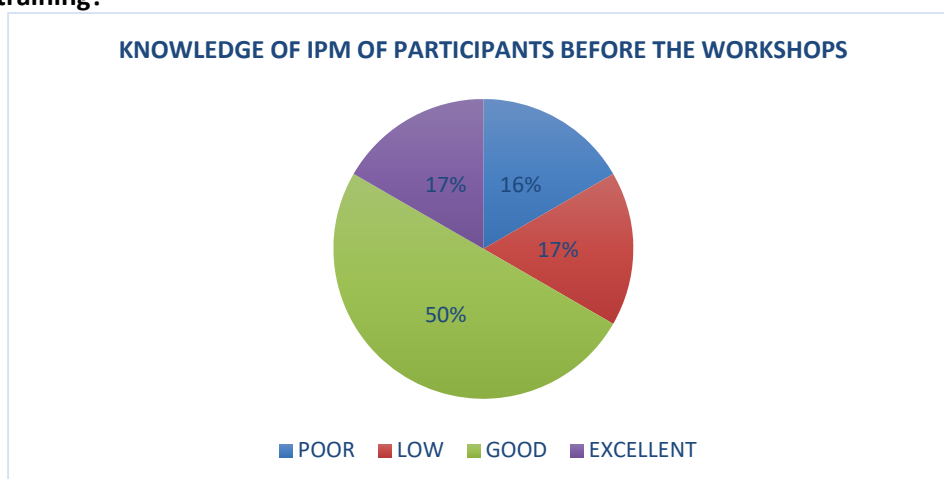


FIGURE 2: Knowledge of IPM of participants before IPM workshops

4. What were the key gains in awareness/knowledge/confidence by the end of training?

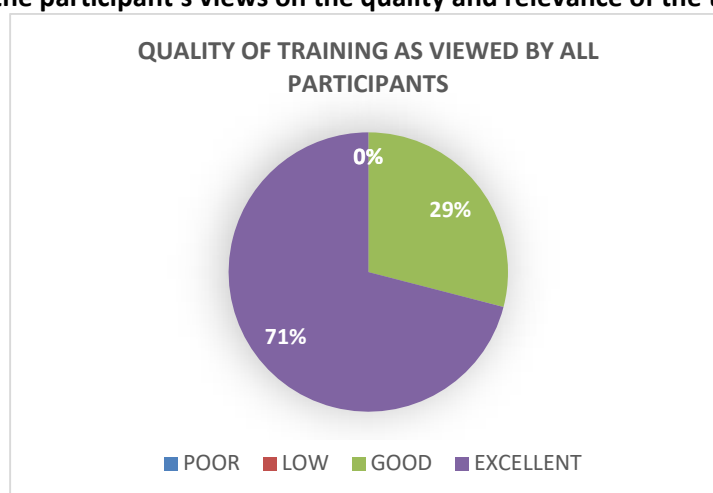
- Greater awareness of beneficial insects and their uses
- Appreciation of the effectiveness of IPM use in vegetable production
- Increased awareness of the effects of pesticide use on beneficial insect populations

- Knowledge of how to integrate different control methods (cultural, release of beneficials, chemistry) into an overall IPM strategy for vegetable production

**5. In the facilitators view, what are the outstanding knowledge/confidence gaps for these participants?**

- Knowledge of the effects of pesticides on the populations of different types of beneficials
- Knowledge of monitoring approaches and the effect of pesticide use on an IPM strategy
- Identification of different beneficials in the field
- Practical integration of IPM into production practices on-farm

**6. What were the participant’s views on the quality and relevance of the training/event?**



**FIGURE 3:** Quality of IPM workshops as viewed by participants

**Positive quotes from participants:**

*“Pictures tell a thousand words, great presentation and step by step.”*

*“Very knowledgeable presenters, especially with cultural and chemical controls of insect pests.”*

**Suggested improvements from participants:**

*“It would be good to discuss further on different IPM strategies other than predators and parasites.”*



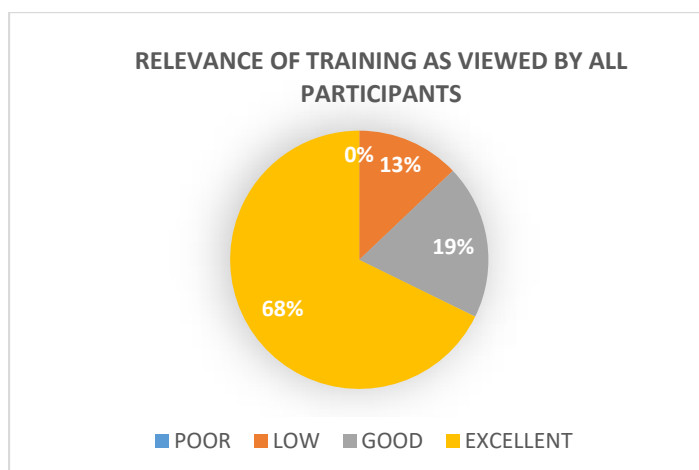


FIGURE 4: Relevance of IPM workshop training as viewed by participants

**Positive quotes from participants:**

*“Covered topics in my field.”*

*“Area has issues with resistance, training demonstrated how IPM can benefit.”*

*“It supported what we have been trying to do for years.”*

**Suggested improvements from participants:**

*“I am not a grower, so not very relevant.”*

**7. What went really well?**

There was strong positive feedback on the module at the end of the session where IPM Technologies planned out an IPM strategy for a specific crop. This was a practical and applied section of the workshop where growers and advisors could see how an IPM strategy would be practically applied on a farm.

Aspects of the workshop where growers were able to view live beneficials were popular with participants as it provided them with the tools to better identify beneficials in their crop monitoring activities.

**8. Areas for improvement**

Some participants requested more information on how IPM could be used to control nematodes.

Practical and applied aspects of the session received the most positive feedback and some participants felt that more pictures and practical examples and case studies would have improved the training day. Overall, however, the training was very well received.

**9. Recommendations**

Participants made the following suggestions for next series of training days to be held in mid-2017:

- Inclusion of more information on usage and release of beneficial populations into greenhouses
- Additional information on natural predators and their lifecycles

- An extension of the section where IPM technologies explained and planned an IPM strategy for different crops

### Report on year 2 theory training

A total of 14 industry representatives and growers participated in the second annual Theory Day training workshops which were held across three locations in late April 2017. As a result of the training a further six advisors and eight growers have been inducted into the program and a further three trial sites established.

#### Event evaluation and feedback

Evaluation forms were collected from all attendees at each event. In addition, AUSVEG SA and IPM Technologies completed an event observation form for each training event.

#### 10. Breakdown of participants:



**FIGURE 1:** Total number of participants for all workshops

#### 11. Breakdown of participants by workshop

**Virginia Workshop with CRT Virginia** 5-Apr-17

TYPE OF PARTICIPANT	NUMBER OF PARTICIPANTS
ADVISORS	2
GROWERS	5

**Murraylands Workshop with Stoller** 7-Apr-17

TYPE OF PARTICIPANT	NUMBER OF PARTICIPANTS
ADVISORS	1
GROWERS	2

**Adelaide Hills Workshop with Biological Services** 12-Apr-17

TYPE OF PARTICIPANT	NUMBER OF PARTICIPANTS
ADVISORS	3
GROWERS	1

**TOTAL:**

TYPE OF PARTICIPANT	NUMBER OF PARTICIPANTS
ADVISORS	6
GROWERS	8

**12. Description of what was covered during the training events**

- Explanation of general IPM concepts
- Introduction to different types of beneficials and their identification using live samples
- Explanation of cultural controls and their use in vegetable production
- Identification of chemical controls which can be used in an IPM strategy
- Explanation of one to two top level IPM strategies for potential use by the resellers and participating growers

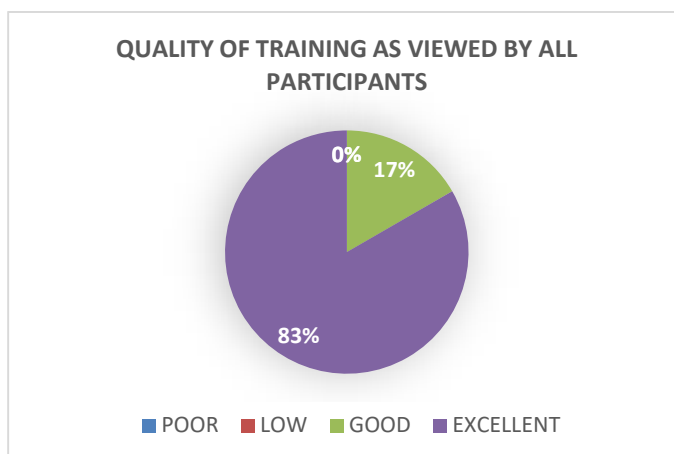
**13. What were the key gains in awareness/knowledge/confidence by the end of training?**

- Initial confidence for growers to start using IPM after seeing the results of Year 1 trials
- Development of IPM plans for participating growers providing them with practical knowledge to initiate trials.
- Addressing specific issues with each crop under production so that advisors and growers had information tailored to their production system and crops.

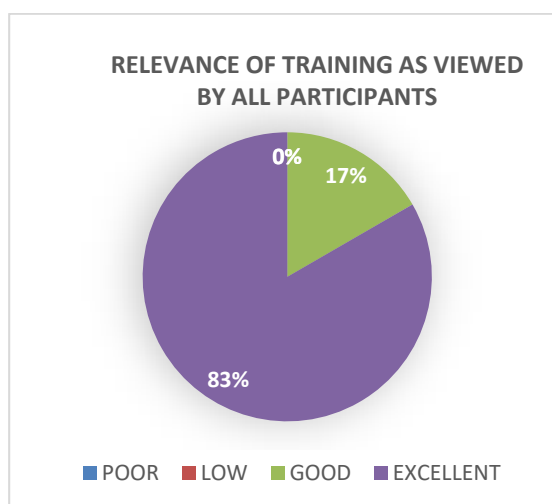
**14. In the facilitators view, what are the outstanding knowledge/confidence gaps for these participants?**

- How to balance pesticide use, pests and beneficials under an IPM system.
- Limited prior knowledge or exposure to IPM practices with the Year 2 growers. In many cases the Year 1 growers had already established part IPM systems, however, some of the Year 2 growers could be challenging.
- It will be a challenge for Biological Services to accept that IPM can work in field situations without release of commercially-reared biological control agents.
- Advisors who are not resellers will need further support to learn about the effects of pesticides on key beneficials and how to select and recommend appropriate chemicals.

### 15. What were the participant’s views on the quality and relevance of the training/event?



**FIGURE 3:** Quality of IPM workshops as viewed by participants



**FIGURE 4:** Relevance of IPM workshop training as viewed by participants

#### Quotes from participants:

“Explanations were very good and the information provided was clear”

“The workshop focused on the specific needs of my farm and we came up with a practical plan”

“Combining the theory work with a field walk was good”

### 16. What went really well?

- Showing new growers inducted into the program the success of Year 1 trials to give them the confidence to trial the program.
- The hands-on field walk component was highly regarded by participants.
- Developing practical IPM plans relevant to each grower to help them to understand IPM production as it relates to their business.
- Application of grower trials to new crops and growing regions in Year 2.

## 17. Areas for improvement

Overall, training was well received and there was no negative feedback.

## 18. Recommendations

Participants made the following recommendations after the 2017 Theory Workshops:

- IPM Technologies will follow up with IPM plans for each of the participating growers
- Growers on the Northern Adelaide Plains want advice for IPM control of redback spiders, which IPM Technologies is following up.
- Biological Services need follow up support to help them identify and recommend chemicals as part of an 'integrated' IPM approach.

## Outcomes

The following outcomes were achieved over the duration of the project over three years.

- The project successfully established over 30 trial sites established throughout the state and successfully integrated all major vegetable advisors and reseller companies operating in South Australia.
- The project achieved strong coverage of the wide variety of crops, growing regions and growing methods (ie protected cropping) throughout the state.
- The extension model adopted as part of this project was so successful that AUSVEG SA is integrating the approach into other field programmes we are running through the state government.
- Four of the participating reseller companies have integrated IPM into their service delivery model and will continue to provide IPM on a commercial basis after the trial.
- The participating biological control producer/crop monitoring service provider (Biological Services) has begun to deliver IPM advice and services in field vegetable crops in South Australia, addition to the services they already offered in protected crops.
- The project has achieved full adoption of IPM from each of the main resellers dealing in vegetables in South Australia as well as the majority of independent agronomists. AUSVEG SA and IPM Technologies are only aware of a small number of agronomists who are not implementing IPM in vegetable crops on a commercial basis. This is a significant achievement for the project.
- 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.
- AUSVEG SA is continuing to provide ongoing on-the-ground assistance and support for the project using our industry networks and will do so after the project concludes.

## Monitoring and evaluation

An external provider was contracted as part of this project to conduct M&E activities. As part of this project, AUSVEG SA participated in M&E activities such as post project interviews and assisted with data collecting to assist project partners IPM Technologies and Clear Horizon.

Results of project M&E activities are included in the separate project reports by Clear Horizon and IPM Technologies.

## Recommendations

IPM Technologies will likely outline production-based recommendations in their separate final report on the technical component of this project.

**Recommendation:** That the approach adopted as part of this project be used in future extension projects.

The approach adopted as part of this project could potentially be examined as an option for future R&D investments through Hort Innovation. While there may be concerns about the investment of levy resources to train supply chain advisors, this project has demonstrated that this approach can be successful in driving practice change with advisors which have broad flow on benefits for growers. Where there is an industry interest in driving practice change through advisors this approach should be considered moving forward.

## Intellectual property, commercialisation and confidentiality

There are no intellectual property, commercialization and confidentiality issues to report. All IP produced as part of this component of the broader project (videos, communications outputs) are all under joint copyright of Hort Innovation, AUSVEG SA and IPM Technologies as per the funding agreement.

## Acknowledgements

AUSVEG SA would like to acknowledge the support of a number of partners who have helped make this Australia-first project such a success.

We thank the participating trial growers for engaging with the process and implementing IPM systems on their farms as part of this project. In particular, those who were early adopters in the project and whose drive to implement these new practices helped make our project such a success.

AUSVEG SA thank the many participating resellers and advisors for their commitment to the project and significant investment of business resources to transition the ways that they deliver crop nutrition and pest management advice to their clients. We were fortunate enough to work with a number of innovative companies and advisors who made significant changes to their practices which were at first daunting.

We thank IPM Technologies for being an exemplary project partner and for their strong on the ground support for industry.

Finally, we thank Hort Innovation for the funding support to implement this project and for sharing our vision in trialing the innovative approach to extension implemented as part of this project.



## Appendices

### Appendix 1: Newsletter Articles

#### **Article 1: Exciting new projects for 2016**

*AUSVEG SA has secured funding for a number of projects in 2016 which will see unprecedented investment in South Australia's vegetable industry.*

AUSVEG SA will be running a number of exciting new programmes in 2016 for our members.

#### **IPM reseller and advisor training**

AUSVEG SA has secured funding to train horticultural advisors and resellers in Integrated Pest Management (IPM) techniques. The project will train three cohorts of agronomists, resellers and other advisors per annum in regions throughout the state.

The project is expected to improve the quality of advice growers receive on IPM techniques and lead to greater uptake of opportunities to integrate IPM or part-IPM practices into growing practices in South Australia.

Interested advisors or resellers can contact the AUSVEG SA State Manager on 0404 772 308 for further information about this exciting Australia-first project.

#### **Export Training**

AUSVEG SA will be running one day export training seminars for growers in the first half of 2016, which will provide growers with hands-on practical training on exporting fresh produce. The goal is to provide practical training which will allow growers to effectively manage issues such as packaging requirements, export permits and regulations.

#### **Inbound export mission**

AUSVEG SA will once again welcome an inbound mission of around 40 leading produce buyers from throughout Asia and the Middle East in June 2016. The delegation will visit leading farms and AUSVEG SA will again host an International Trade Evening where growers and wholesalers will be able to meet and network with buyers. We are excited by the opportunity to continue this event and build on last year's successful event.

#### **Watch this space**

AUSVEG SA expects to announce a number of additional projects in the coming months which will amount to an unprecedented investment in programmes for South Australia's \$550 million vegetable industry. We continue to grow as an association and are thankful to our many members for their support since inception.

AUSVEG SA will continue to look for funding opportunities to provide on-the-ground programmes for our members and the AUSVEG SA State Manager is happy to answer any questions regarding our exciting forward programme of events.

## **Article 2: Call for growers interested in establishing IPM trials as part of landmark project!**

*AUSVEG SA and IPM Technologies have finalised the first round of theory training for our Australia-first IPM program and are looking for growers interested in conducting trials to participate over the final two years of the project.*

AUSVEG SA and Victorian-based Integrated Pest Management (IPM) consultancy IPM Technologies recently held a series of workshops with resellers and growers throughout South Australia to provide hands on training in IPM management techniques for growers. Over the past year and a half we have worked with the vast majority of reseller and agricultural advisory companies throughout the state to provide baseline training in IPM production, and are now moving to the stage where we are seeking to establish as many trials as possible to give the opportunity for SA growers to trial IPM practices on their property.

The project, funded by Hort Innovation Australia using the National Vegetable Levy, provides rural resellers and advisors with hands on advice in implementing Integrated Pest Management (IPM) techniques with growers which use beneficial insects and lower reliance on traditional pesticides and herbicides. IPM is a crop management technique which uses cultural controls (i.e management practices), beneficial insects and selective use of crop protectants to manage crops. The benefits of IPM include a reduced reliance on chemistry and better resistance management outcomes for growers.

An important part of this program is that IPM Technologies take a hands-on approach to developing crop management plans specific to different crops and pest pressures and supporting resellers and advisors to trial IPM techniques in regions throughout South Australia. Initial trials have achieved fantastic results, with low pest pressures and high quality crops.



*Participants at one of the workshops monitoring a trial site established in year one of the project*

The second annual series of Theory Days for growers and resellers were held in late April and involved a half day induction training session to familiarise participants in IPM techniques and practices. The majority of reseller companies in SA have been inducted into the program and now able to work with growers on implementing IPM management plans.

AUSVEG SA welcomes grower participation in the project and growers can volunteer to work with their local advisors and resellers as part of this project.

**Further information:** call the AUSVEG SA State Manager on 0404 772 308 or [ausvegsa@ausveg.com.au](mailto:ausvegsa@ausveg.com.au)

### **Article 3: Opportunity to trial IPM on your farm as part of**

## landmark SA project

*The Australia-first Integrated Pest Management (IPM) project run by AUSVEG SA and IPM Technologies will reach its final year in 2018 and we are seeking interested vegetable growers who would like to run fully-supported trials of IPM on their properties.*

This project has been made possible by funding from Horticulture Innovation Australia using the National Vegetable Levy and funds from the Australian Government and AUSVEG SA encourages any interested growers to apply for trials under the program while places are available!

### Call for growers

Under the program, vegetable growers will be supported to implement IPM production practices on their property using local advisors and national IPM experts. The project has already received strong results for growers in the region.

Grower support includes:

- Ongoing support through a local advisor who has been formally trained to implement IPM on your property.
- Access to national support and advice provided by internationally-renowned IPM consultancy IPM Technologies.
- Ongoing assistance in management and monitoring of crops.

Key results for growers under the trials conducted to date have included:

- Reduced pest pressures in key crops
- Reduced spray applications throughout growing seasons
- Exceptional crop quality results and low crop damage.

**Register your interest:** For further information on the AUSVEG SA and IPM Technologies project call the State Manager on 0404 772 308.



*IPM Technologies staff and local advisors view a trial crop on the Northern Adelaide Plains*



*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: Final year trials available under landmark IPM program

*AUSVEG SA has a number of funded trial opportunities available for growers who would like to trial Integrated Pest Management under our innovative Hort Innovation-funded IPM development program.*



*Growers and advisors attend a recent IPM Field Day held on the Northern Adelaide Plains*

The project has successfully worked with a number of advisors throughout South Australia to successfully implement IPM across a number of their clients with assistance from interstate consultancy IPM Technologies, which is providing the expertise necessary to develop trials throughout South Australia. Resellers and advisors in the region have been very happy with the project to date and the pest and disease control they are achieving using IPM principles with their client growers - particularly in field brassica and lettuce crops.

AUSVEG SA has one year left of funding on this exciting project, so any interested growers should talk to their local reseller or call our office if they would like to establish a trial through the program.

AUSVEG SA is also happy to help arrange a walkthrough of successful trial sites for growers who would like to see the results which have been achieved.

AUSVEG SA is proud to help run this innovative IPM development program, which is a great example of how the National Vegetable Levy has been used for the benefit of growers throughout South Australia. We thank Hort Innovation for funding this program and hope to work to develop more initiatives into the future.

**Hort  
Innovation**  
Strategic levy investment

**VEGETABLE  
FUND**

This project has been funded by Hort Innovation using the vegetable research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit [horticulture.com.au](http://horticulture.com.au)

## **Article 5: IPM field walk: see the results of our Northern Adelaide Plains trials!**

AUSVEG SA welcomes all South Australian growers to attend a field walk through one of the Integrated Pest Management trials conducted as part of our Australia-first IPM program.

**Date:** Thursday 15 February 2018

**Time:** 3:00pm-4:00pm

**Location:** T Musolino and Co, Broster Road Virginia

Growers will have an opportunity to see how IPM pest management techniques have been successfully applied in a field brassica commercial growing operation and learn more about the project from interstate IPM experts, local agronomists and growers involved in the trial.

AUSVEG SA has a number of places available for growers who would like to trial IPM production practices in the final year of our project, so the field walk provides an opportunity to see the results of IPM production practices in action and learn about how to participate in the final trials available as part of the project.

### **Project background**

Over the past two years AUSVEG SA has partnered with IPM Technologies and Hort Innovation to deliver an Australia-first program to assist local growers to adopt IPM practices in their businesses. The program has involved educating local resellers and advisors in IPM production practices and helping them to establish trials with their client growers.

### **Grower results**

The program has seen fantastic results for growers in the region including:

- Exceptional quality crops under IPM production practices and minimal crop damage
- Effective management of pest pressures throughout growing seasons under trial



- Better resistance management for growers and use of softer and targeted chemistry

AUSVEG SA encourages any interested growers to come along to this event to learn more about this project and participate in the final round of trials available as part of this exciting project!

**Register today!**

To register for this event, please contact the AUSVEG SA Office on 0404 772 308 or email [ausvegsa@ausveg.com.au](mailto:ausvegsa@ausveg.com.au)

**Hort  
Innovation**  
Strategic levy investment

**VEGETABLE  
FUND**

This project has been funded by Hort Innovation using the vegetable research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit [horticulture.com.au](http://horticulture.com.au)

## **Article 6: IPM field walk: see the results of IPM in a greenhouse setting**

AUSVEG SA will be holding a field walk through one of the Integrated Pest Management trials on Thursday 8 November as part of our Australia-first IPM program. See how leading grower Daniel Hoffman has implemented IPM on his farm with support of local advisors and is managing pests and diseases using IPM principles.

**Date:** Thursday 8 November 2018

**Time:** 4:00pm-5:00pm

**Location:** Lot 20 Andrews Road Penfield SA

Growers will have an opportunity to see how IPM pest management techniques have been successfully applied in a greenhouse growing operation and learn more about the project from interstate IPM experts, local agronomists and growers involved in the trial. Daniel has been a leader in adopting IPM principles in his business and has adopted a number of low cost initiatives which lead to better resistance management and effective control.

### **Project background**

Over the past two years AUSVEG SA has partnered with IPM Technologies and Hort Innovation to deliver an Australia-first program to assist local growers to adopt IPM practices in their businesses. The program has involved upskilling local resellers and advisors in IPM production practices and helping them to establish trials with their client growers. AUSVEG SA encourages any interested growers to come along to this event to learn more about this project and opportunities to work with local advisors to implement IPM in their businesses.

**Register today!** To register for this event, please contact the AUSVEG SA Office on 0404 772 308 or email [ausvegsa@ausveg.com.au](mailto:ausvegsa@ausveg.com.au)

Appendix 2: Media Releases

24 February 2016

For immediate release

# Media Release

## New SA program to increase adoption of low pesticide growing techniques

The South Australian vegetable industry will benefit from a new Australia-first program to train resellers and advisors in Integrated Pest Management (IPM) vegetable growing strategies.

IPM is a crop management technique that uses predatory insects to control pests and diseases, lowering reliance on traditional pesticides and insecticides.

As part of the project, AUSVEG SA has partnered with a leading advisory company in this sector, IPM Technologies, to deliver training to resellers throughout South Australia in IPM growing techniques.

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

“IPM has long been recognised as an effective means of pest management; however, there has only been sporadic adoption with growers,” said AUSVEG SA State Manager Mr Jordan Brooke-Barnett.

“We recognise the important role advisors and rural resellers play in our growers’ decision-making process, so we are confident that training these experts in IPM will lead to greater uptake in industry.”

The innovative project will ensure South Australia will stay at the forefront of new production techniques and help safeguard the state’s reputation as a clean, green food producer.

“The South Australian Government is spending a lot of money and resources to promote our state’s reputation as a clean, green producer of food,” said Mr Brooke-Barnett.

“This project will ensure that South Australian growers can access IPM – a low-pesticide and environmentally-friendly method of growing. As such, this project will ensure that South Australian growers have cleaner, greener credentials than their interstate counterparts.”

The innovative IPM training project is the first of its kind in Australia and could potentially become a best-practice pilot study for other states.

“AUSVEG SA is constantly looking for innovative projects like this to ensure South Australian growers are delivering the highest quality produce possible to the market,” said Mr Brooke-Barnett.

“If our industry is to access promising export markets in Asia, we need to be able to show our safety and environmental credentials. This project is part of our strategy to put South Australian produce at the top of the list with international buyers.”

This project is funded by Horticulture Innovation Australia using the National Vegetable Levy and funds from the Australian Government. **ENDS**

5 May 2017

For immediate release

## **Australia-first project putting SA at the forefront of low chemical horticulture production**

South Australia is affirming its reputation as a clean, green producer of food with the first trials now completed under an Australia-leading program to teach growers about low chemical production methods utilising insects to kill crop pests.

“Trials have now been completed at two sites in the Adelaide Hills and Northern Adelaide Plains production areas. Initial results have shown that growers are able to produce high quality crops using naturally occurring beneficial insects,” said AUSVEG SA State Manager Mr Jordan Brooke-Barnett.

Integrated Pest Management (IPM) uses naturally occurring insect predators to kill pests which cause crop damage and affect yields. The IPM trial programme, funded by Hort Innovation Australia and run by AUSVEG SA and Victorian-based IPM Technologies trains agricultural advisors in IPM techniques so that they can initiate trials with client growers.

“AUSVEG SA has been extremely proud of the results to date with a large number of growers embracing the program and the fantastic trial results we have been able to achieve with the program”, said Mr Brooke-Barnett.

“As we look at growing our exports to feed growing markets in Asia, having programs such as this in place will give domestic and international consumers the confidence that our South Australian growers are reliable producers of safe, environmentally-responsible produce.”

The AUSVEG SA and IPM Technologies trial program will be funded for another two-years and we expect further success stories from the project. The program is expected to leave a strong legacy for South Australian horticulture production as advisors in South Australia will be trained to give IPM advice into the future.

Appendix 3: Fact Sheets

# Natural enemies of aphids in vegetable crops

VEG  
IPM  
NOTE

### Outdoor vegetable crops

In outdoor vegetable crops the most important natural enemies of aphids are lacewings, hoverflies, and parasitoid wasps. Typically some or all of these can be found in the crop shortly after aphids arrive, and can provide excellent control as long as disruptive pesticides have not been applied. Ladybirds often arrive later, and play an important role in cleaning up any large aphid populations that have been allowed to build up.

### Protected vegetable crops

In protected vegetable crops the same beneficial insects can also turn up naturally, but often there are too few or they arrive too late to provide control. Parasitoid wasps are available for a range of aphid species, and releases of these beneficials should be considered as soon as aphids are detected in protected crops.

### What to look for

When monitoring, look out for both aphids, and the eggs of predators. If aphids are present, also look for signs of parasitised aphids. Take note from one week to the next of the relative numbers of aphids and beneficials, before deciding whether chemical support is necessary.

### Chemical support

Selective aphicides can be applied to support biological and cultural controls, if necessary. IPM Technologies can provide assistance when it comes to deciding whether a spray is necessary, and which product is most suitable.

It is important to select the product that will cause minimal disruption to the full range of beneficials that are working to control aphids and other pests in your crop.



*Parasitoid wasp (3 mm) inserting egg into aphid (Photo: Denis Crawford, Graphic Science)*



*Adult brown lacewing (10 mm) (Photo: Denis Crawford, Graphic Science)*



*Adult hoverfly (10 mm) (Photo: Denis Crawford, Graphic Science)*



*Adult common spotted ladybird (10 mm)*



*Parasitised aphids (2 mm)*



*Brown lacewing eggs (1 mm)*



*Hoverfly eggs (1 mm) laid amongst a colony of aphids*



*Ladybird eggs (2 mm)*



*Adult wasp (3 mm) emerging from aphid mummy*



*Juvenile brown lacewing (10 mm) feeding on an aphid*



*Juvenile hoverfly (8 mm) on left, beside aphids and juvenile brown lacewing on right*



*Juvenile ladybird (10 mm)*

These notes have been prepared by IPM Technologies for growers and advisors participating in VG15034. This project has been funded by Horticulture Innovation Australia Limited using the vegetable levy and funds from the Australian Government.

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# Pheromone traps for Heliothis

VEG  
IPM  
NOTE

## How the traps work

A pair of funnel traps (each containing a species-specific pheromone lure) is set up at each site to monitor the adult populations of two species of *Heliothis* (now called *Helicoverpa*):

- corn earworm (*Helicoverpa armigera*)
- native budworm (*Helicoverpa punctigera*)

## How the information can be used

There are a couple of very practical reasons for using pheromone traps to monitor adult *Heliothis* activity.

Firstly, the traps tell us which of the two species are present, and this will help with selection of any insecticides. *Helicoverpa armigera* is more difficult to control than *H. punctigera*, and so different sprays should be used if this species is present.

Secondly, the traps provide an early warning of pest pressure and allow much more precise timing of any sprays to target small and vulnerable stages.

This method of monitoring is not a substitute for direct searching in the crop for moth eggs, small caterpillars and beneficial insects. The two methods are complimentary and together they help to inform timely and appropriate management decisions.

## How to set up the traps

1. Set up two traps per site (one for each species), spaced about 10 metres apart.
2. Label both the lid and base of each trap: one with the letter A (for *armigera*) and the other with the letter P (for *punctigera*).
3. Remove the plug on top of the lid, and use a paper clip to attach the pheromone lure to the lid. The lure should hang between the lid and the funnel. Make sure you attach the correct lure to each labelled trap.
4. Half-fill the trap with water and a drop of dishwashing liquid. Mix the solution and close the trap.
5. Suspend each trap from a star picket
6. Replace the lures every six weeks.

## How to check the traps

Check traps weekly. Remove the lid, tip the contents of the trap onto the ground and count the total number of moths. Repeat for the second trap, then refill traps with water and dish washing liquid before replacing them on their star pickets.



**Top:** an adult *Heliothis* moth  
**Centre:** a pair of funnel traps used for *Heliothis* monitoring, beside a celery crop  
**Bottom:** a funnel trap

These notes have been prepared by IPM Technologies for growers and advisors participating in VG15034. This project has been funded by Horticulture Innovation Australia Limited using the vegetable levy and funds from the Australian Government.



# Monitoring for Heliothis

VEG  
IPM  
NOTE

## Pheromone traps and direct searching

Pheromone traps and direct searching are two complimentary monitoring methods that help to inform timely and appropriate management decisions for Heliothis (now called *Helicoverpa*).

A pair of pheromone traps can be used to monitor adult populations of the two species (*Helicoverpa armigera* and *Helicoverpa punctigera*). The traps tell us which species are present, and this helps with the selection of suitable insecticides. They also give an early warning of pest pressure.

Pheromone traps are not a substitute for direct searching in the crop.

Weekly monitoring for moth eggs, small caterpillars and beneficials should commence after adult Heliothis have been detected in the traps. By looking at the colour of moth eggs, and predicted weather conditions, it is possible to estimate when the eggs will hatch, allowing for precise timing of sprays to target small vulnerable caterpillars.



A *Heliothis* moth



A funnel trap used for monitoring adult *Heliothis* activity

## Things to look for

Heliothis eggs are round and about 1mm diameter. Freshly laid eggs are white. A brown ring appears on the egg as the caterpillar inside develops. Just before the caterpillar hatches, its dark head capsule can be seen through the egg shell.

First instar caterpillars are very small (just 1-3mm long).

A range of beneficials can contribute to Heliothis control in vegetable crops.

Trichogramma wasps parasitise Heliothis eggs (and other moth eggs). Parasitised eggs are easily recognised because they turn black.

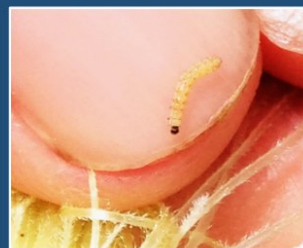
Various generalist predators such as lacewings, ladybirds and predatory bugs feed on Heliothis eggs and caterpillars. The most important predators of this pest in vegetable crops are usually damsel bugs (also called nabid bugs).



Two freshly laid *Heliothis* eggs (1mm)



A maturing *Heliothis* egg (1mm)



A first instar *Heliothis* caterpillar (2mm)



An adult damsel bug (predator, 12mm)

These notes have been prepared by IPM Technologies for growers and advisors participating in VG15034. This project has been funded by Horticulture Innovation Australia Limited using the vegetable levy and funds from the Australian Government.



#### Appendix 4: Case Studies

The following case studies were produced and published in the AUSVEG SA Newsletter which is regularly distributed to around 850 growers and industry members in South Australia.

### **Case Study 1: IPM Case Study: trial yields quality results for Northern Adelaide field producer**

AUSVEG SA and IPM Technologies have been working together on a Hort Innovation Australia funded project to increase adoption of Integrated Pest Management (IPM) in South Australia.

As part of the Australia-first project, reseller agronomists are trained in IPM techniques and are conducting a number of trials with growers throughout our state. The case study below examines the success of Virginia-based advisor Nick Halkias of Complete Ag and Seed Supplies who has been working with local grower Domenic Pellicone to trial IPM production practices.

**Case Study:** Domenic Pellicone

**Location:** Virginia, South Australia

**Advisor:** Nick Halkias, Complete Ag and Seed Supplies Virginia

**Key crops:** Cauliflower, Cabbage

The following case study contains an interview with advisor Nick Halkias of Complete Ag and Seed Supplies outlining the success of the trial and program to-date.

#### **How have you found the program?**

It has worked really well. We didn't really know what to expect when we started out, but we put an IPM production system to the test and it has worked out great.

The number of grubs and Diamond Back Moth are down in the trial crop and the quality is great. We are still spraying with soft chemistry on occasion and



we are seeing minimal crop damage.

The ongoing support from IPM Technologies staff has been great and has taken the risk out of adopting the new IPM production system for both me and the trial grower. I have them in my phone and they always respond within the hour with advice.



*IPM Technologies work with local advisors to monitor the Northern Adelaide Plains trial*

**What have you changed as part of the trial?**

After participating in the trial I have been more selective about what I recommend to customers and look at options which do not impact on beneficial insects. We have also increased our crop monitoring to once per week, whereas we used to be out on property on more of a needs basis.

**What results have you been able to achieve for your grower?**

We have been spraying less and achieving great quality results. Our trial grower reports that the current crop under trial is the best he has ever had! This is even in a cabbage crop, which is difficult to manage using IPM.

With the results we have achieved, I am looking at expanding the number of growers in the region trialling IPM.

**Do you think you will apply this knowledge in the future?**

Yes, definitely. We are already working to get more growers involved with the IPM Technologies trial program. We just need to promote our current successes to convince growers that IPM really does work.



**Further information:** For further information on the AUSVEG SA and IPM Technologies project call the State Manager on 0404 772 308.

The AUSVEG SA and IPM Technologies IPM project will run for another two years and we welcome any further participation from growers or advisors who would like to establish trials.

## **Case Study 2: IPM Case Study: New techniques yield quality results for Pitchford Produce**

AUSVEG SA and IPM Technologies have been working together on a Hort Innovation Australia funded project to increase adoption of Integrated Pest Management (IPM) in South Australia.

As part of the Australia-first project, reseller agronomists are trained in IPM techniques and are conducting a number of trials with growers throughout our state. The case study below examines the success of Currency Creek-based growers Pitchford Produce, who have been working with their agronomists Hayden Hands and David Oddie of DJ's Grower Services and Nigel Dolenec of EE Muir and Sons to implement IPM on their farm.

**Case Study:** Pitchford Produce

**Location:** Currency Creek, South Australia

**Advisor:** Nigel Dolenec, EE Muir and Sons

**Key crops:** Broccolini, Cabbage, Lettuce

The following case study contains an interview with advisor Nigel Dolenec of EE Muir and Sons outlining the success of the trial and program to-date.

### **How have you found the program?**

The program has been very worthwhile, particularly the ongoing contact with IPM Technologies to get our trial up and running. The program has also been worthwhile in getting me out in the crop more often and engaging with the production staff at Pitchford Produce to manage the crop.

Having the support on hand has been important to managing the risk of transitioning to an IPM crop management strategy as there are significant dollars on the line with any vegetable crop.



- *IPM Technologies staff and participating advisors monitor the trial at Pitchford Produce.*

### **What have you changed as part of the trial?**

We developed an IPM strategy with IPM Technologies for controlling pests in lettuce, broccolini and cabbage. This involved ceasing routine insecticide applications and relying instead on natural predators and selective insecticides (including the biological crop protectant DiPel) where necessary. We have also seen how cultural practices such as weed management can help to reduce pest pressure. The main change was that I have been doing a lot more hands on monitoring of the crop and the grower and I have a weekly monitoring plan where we share the monitoring load. Aside from the increased monitoring and a changed spray regime, not a lot has changed for Pitchford Produce.

### · **What have been the benefits to you as an advisor?**

I have been able to develop skills which are adding value to my business. This includes the opportunity to work more closely with client growers on production and advising on IPM implementation. Understanding IPM is essential and needs to be part of my repertoire, along with other areas such as an understanding of resistance and rotations.

### · **What results have you been able to achieve for your grower?**

The crops under trial are looking really good with low caterpillar damage, and cultural

practices have helped to reduce thrips activity in the lettuce. We hope to get a good cut out with minimal wastage at harvest.

· **Do you think you will apply this knowledge in the future?**

Without a doubt. We will look to trial more IPM strategies with all our brassica clients in particular.



**Further information:** For further information on the AUSVEG SA and IPM Technologies project call the State Manager on 0404 772 308.

The AUSVEG SA and IPM Technologies IPM project will run for another two years and we welcome any further participation from growers or advisors who would like to establish trials.

### **Case Study 3: IPM Success Story: Northern Adelaide Plains Greenhouse Grower Develops Highly Successful Low-Input IPM System**

*Northern Adelaide Plains vegetable grower Daniel Hoffman has recently fine tuned a highly successful IPM system on his property with support from IPM Technologies and a National Vegetable Levy project run in partnership with Hort Innovation Australia and AUSVEG SA.*

Daniel Hoffmann is a greenhouse vegetable grower on the North Adelaide Plains, near Virginia with a farm of 11 acres producing a number of lines. In addition to the main crop

of tomatoes which are grown in polyhouses, he also grows crops such as spinach, broccoli, cabbage, Asian greens, spring onions, snow peas, various beans, chillies and herbs. These crops are grown for sale at local farmers markets.

Daniel now controls insect, mite, and nematode pests using an Integrated Pest Management (IPM) approach, but beforehand he used a chemical-based approach which was standard for the district. This involved fumigating the soil with products such as metham-sodium and then spraying an insecticide or miticide weekly for each pest as required.

This was the standard conventional approach for growers in the district and still remains so for many, but Daniel observed progressively poorer results from sprays and fumigation and also that the plants seemed to be weakened by the multiple pesticide applications. This led him to look at other options and so explore the use of IPM.

The change was fairly quick and after three years 90% of hard work the farm was shifted to IPM.

The first step was to stop using broad-spectrum products that were designed to kill a wide range of invertebrates. Instead of fumigating the soil Daniel used break crops such as sorghum and mustard or radish crops in rotation with his fruit and vegetable crops. Instead of spraying products that killed beneficial insects and mites he used more selective products and began buying and releasing commercially produced beneficial insects and mites. These were predators or parasites of the key pests in his crops. In addition, he began brewing up his own microbe mixes and using natural fish fertilisers, worm fertilisers and soil conditioners.

Daniel comments “I had to learn a lot before and during the change; how to bring my soil back to life and how to control soil pathogens without chemicals. I had to learn what insects did, what they looked like, what new softer chemistry to use to target pests while not killing off the good guys, and also what were acceptable levels of pests.”



*Northern Adelaide Plains vegetable grower Daniel Hoffman has successfully adopted IPM as part of his production system.*

To achieve this Daniel got advice from biological experts, bug experts and agronomists. However, it was not an easy transition. Thirty years of farming a certain way does not change overnight and in the beginning, there were problems. There were soil disease problems and beneficial species could not get established because of chemical residues. Daniel had to be patient and keep working on improving the soil health and biology and using different insecticides to keep pest numbers down until the predators and parasites could get established.

Now his patience has been rewarded. “It has all paid off now. I rarely spray at all apart from the odd fungicide when it’s needed. I have grown entire crops of tomatoes over five months and have only needed to spray once or twice the whole time and that’s mostly for powdery mildew or to bring down whitefly numbers slightly until *Nesidiocorus* (a whitefly predator) can get back in control.”

AUSVEG SA is currently in the final year of our Australia-first IPM facilitation program which supports growers and field advisors to implement IPM systems throughout the state. Any growers interested in the project can contact the AUSVEG SA CEO on 0404 772 308.

Appendix 5: Media Articles



*Brussels sprouts farmer Scott Samwell has been releasing a parasitic wasp on his Mt Barker property in a new trial which could be the future of pest control.*

**By Rhody Gleeson**

It sounds like the stuff of horror movies but a parasitic wasp whose larvae devour caterpillars from within is the latest weapon in the battle to keep Hills farms pest free.

Mt Barker Brussels sprout grower Scott Samwell has enlisted the small diatom wasp in a trial which has the potential to revolutionise farming.

Instead of spraying his fields with harsh pesticides, Mr Samwell releases hundreds of wasps which target the diamondback moth notorious for destroying entire fields of cabbages, cauliflowers and Brussels sprouts.

Aided by the use of a 'soft' pesticide, the wasp lays an egg inside the caterpillar with the newly hatched larvae slowly eating its way out, only killing its host once it is ready to

pupate and find a new caterpillar for its own offspring.

"It's like something out of an alien movie except it's real and I'm glad to have it on my side," Mr Samwell said.

The Samwell family has been trialling the new strategy since August across 11ha of Brussels sprouts at their Bald Hills Road farm and, while it is too early to determine the success of the program, Mr Samwell said he felt "optimistic".

**Future of farming**

"I honestly think it's the future," he said. "We've already seen the caterpillars develop resistance to chemicals in Queensland and it takes the scientists a good 10 to 15 years to come out with a new spray.

"These grubs may be small but they can do a lot of damage.

"If we did nothing they would destroy

our whole crop, no doubt about it, so if we can find ways of controlling them naturally then I see that as the way forward."

Growing to between 5-7mm, the wasps are strong fliers laying up to 800 eggs during their 25-day lifespan.

Mr Samwell receives wasps as pupae on paper cards which are placed in special release containers out in his fields at around 250 wasps per hectare.

The agricultural industry learnt a lot from the disastrous introduction of cane toads in the 1930s and entomologist Angelica Cameron from IPM Technologies – the company helping run the trials – said there was no chance the caterpillar killer could go rogue.

"They rely solely on this one type of caterpillar to complete their life-cycle which makes them the perfect candidate," she said.



Appendix 6: Communications strategy for project

# Facilitating adoption of IPM by vegetable growers through a participatory approach with local advisors and industry

## Communications Plan

Prepared by Jordan Brooke-Barnett

1 June 2017

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## Document History

Date of this revision: 1 June 2017

Date of next revision: 1 June 2018

Revision Date	Previous revision date	Summary of Changes	Changes marked
16 March 2016	N/A	N/A	N/A
8 April 2016	16 March 2016	Additional information resulting from M&E meeting in Melbourne	No
21 May 2017	8 April 2016	Additional information added in line with finalised M&E documents.	No
1 June 2017	21 May 2017	Additional updates to reflect discussions at project reflections workshop in early May and project variation.	No

### 1. Objectives of the project

A short summary/statement of the project objectives.

The vision/broader goals of the project include:

- IPM becoming the mainstream method of controlling pests in the vegetable industry
- Increased quality and sustainability of vegetable crops
- Increasing uptake of IPM practices among vegetable growers by assisting agronomists and advisors to become more knowledgeable and confident in using IPM in their work with growers.

Intermediate objectives:

1. Engage with resellers and advisors and train them in IPM principles.
2. Encourage resellers and advisors to adopt IPM principles and use them when advising growers.

Scope of the IPM project:

1. Engage with resellers and advisors and train them in IPM principles
2. Engage with growers to increase knowledge of and participation in the project
3. Engage with government, retailers and community to build high level support and awareness of the project.

## 2. Communications objectives, principles and key messages

A clear detailed statement of the objectives in communicating, the principles underpinning this strategy and your key messages. These should be aligned with the objectives of the programme/centre.

1. To ensure that the stakeholders in the reseller and advisor industry are aware of the project, understand why it is necessary and what benefits it will deliver.
2. To ensure that stakeholders in the reseller and advisor industry support the project and provide staff members for training.
3. To ensure that resellers and advisors receive the information, tools and follow up support to confidently recommend and advise grower clients on the adoption of IPM principles in their growing.
4. To ensure that broader stakeholders such as produce buyers, growers, government and the general public are aware and supportive of the project as a means of promoting IPM as being a 'mainstream' production practice.
5. To provide timely and accurate information to the identified stakeholders about workshops and the benefits of participating in the programme.

### 3. Key Audiences

Who are you communicating with – a detailed description of your key audience and user groups. What are your priorities?

Audience	Approach	Responsibility
Resellers and advisors	<p>Phone calls to encourage initial participation in the programme.</p> <p>Email expression of interest to be part of the programme distributed using AUSVEG SA industry communications channels.</p> <p>Initial face-to-face briefing on the project in the lead up to annual workshop and field day.</p> <p>Phone calls and face-to-face meetings to match growers willing to participate in the programme (ie by trialling IPM with advisors) and participating advisors.</p> <p>Ongoing support from IPM technologies via email communications and phone contact.</p> <p>IPM Technologies Theory Day and Field Day (1 pa in 3 separate SA regions)</p>	<p>AUSVEG SA</p> <p>AUSVEG SA</p> <p>IPM Technologies</p> <p>AUSVEG SA</p> <p>IPM Technologies</p> <p>IPM Technologies and AUSVEG SA</p>
Growers	<p>Industry email communications around the programme to encourage engagement showcasing case studies.</p> <p>Phone calls and face-to-face meetings to match growers willing to participate in the programme (ie by trialling IPM with advisors) and participating advisors.</p> <p>Delivery of series of Field Walks around established trials to encourage grower participation in year three trials with inducted advisors.</p>	<p>AUSVEG SA</p> <p>AUSVEG SA</p> <p>AUSVEG SA</p>
Influencers		
Public	<p>Media Releases and announcements to gather support for the project and awareness of IPM production practices.</p>	<p>AUSVEG SA</p>
HIA	<p>Regular project updates through formal reporting process.</p>	<p>AUSVEG SA</p>
Government	<p>Media Releases and announcements to gather support including potential funding extension or opportunities to raise the profile of the programme through communications.</p>	<p>AUSVEG SA</p>

	<p>Communication through industry communications channels to keep relevant government officials up to date on project results</p> <p>Year 3 training of selected South Australian Government field staff in Biosecurity SA and Rural Solutions so they understand the project.</p>	<p>AUSVEG SA</p> <p>AUSVEG SA and IPM Technologies</p>
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#### 4. Key Messages

What messages are you communicating – a detailed description of your key messages in order to achieve the desired communications objectives.

<p>Project Objectives, Scope, Vision</p>	<p>This project is an Australia-first project to increase the uptake of IPM principles in vegetable production.</p> <p>The project builds on the South Australian Government’s priorities to make South Australia a leading producer of ‘Clean, Green Produce’</p> <p>The project takes an innovative approach in teaching the people advising growers, so they can provide better advice to their clients.</p> <p>This project has been one of the most successful National Vegetable Levy projects ever funded in South Australia with nine trials achieved since commencement.</p>
<p>Stakeholder Roles</p>	<p>Communications will acknowledge the following partners on this project:</p> <p><b>AUSVEG SA</b></p> <p>State representative body responsible for achieving reseller and grower support for the programme.</p> <p><b>IPM Technologies</b></p> <p>Leading Australian IPM company and technical partner delivering information support and resources to participating resellers and growers.</p> <p><b>HIA</b></p> <p>Source of project funding acknowledged using standard funding acknowledgement.</p>

#### 4. Communicators

In order for communications to be effective, the right people must be delivering the message. Who the right person is depends on the message and the audience. Consider who will be the key communicators throughout the project and what each will be responsible for.

Communicator	Objectives & Responsibilities
AUSVEG SA	Responsible for all non technical or educational communications as part of the programme (industry case studies, contact with resellers and growers to drive participation, field day promotion)
IPM technologies	Responsible for all technical and educational communications as part of the programme (field days, information resources, reseller support)
Participating resellers	To provide input into communications or case studies on reseller experiences with the programme.
5.1 Participating growers	To provide input into communications or case studies on grower experiences with the programme.
5.2 AUSVEG SA	To provide oversight of all non-technical communications around this programme.
5.3 IPM Technologies	To conduct all technical and educational communications around this programme.
5.4 HIA	To provide overall communication support through communication with government and broader industry stakeholders.

#### 6. Methods of Communication

What methods of communication will be used, how often and for what purposes?

5. Email	<p>Emails to AUSVEG SA members encouraging participation in the project</p> <p>Emails to group of resellers expressing interest in the project to encourage participation.</p> <p>Regular email contact between IPM Solutions and participating resellers</p> <p>Periodic case studies and project updates for industry distributed in the AUSVEG SA Newsletter (circulation 850).</p>
Workshops	1 Theory Workshop and 1 Field Workshop each year

Field Walks	Commencement of Field Walks end of Year two to encourage additional growers to work with trained advisors to establish trials across a broad range of regions and crop types in Year 3 of the project.
Reports	Milestone Reports and Final Report
One-to-One meetings	<p>Meetings with resellers to encourage participation in the project and brief them on requirements</p> <p>Meetings with growers to encourage them to participate in the project with their advisors</p> <p>Regular phone calls to participating growers and resellers as part of the programme</p>
Video Case Studies	Development of case study videos on successful trial sites to highlight the benefits and experiences of growers and advisors participating in the project and the results they have achieved.

## 6. Communication Activities

Media / Events	Objective	Message	Frequency	Delivered to:	Delivered by:	Feedback Mechanism
Media Release	Achieve broad awareness of the project from influencers (public, government, growers)	Overall project key messages	At least one per annum	Media, Government, Industry	AUSVEG SA	Media hits
Theory and Field days	Deliver technical and educational support to participants	Technical and educational information	1 Theory and 1 Field Day per annum	Resellers with support from participating growers	AUSVEG SA and IPM Technologies	M&E plan

Media / Events	Objective	Message	Frequency	Delivered to:	Delivered by:	Feedback Mechanism
AUSVEG SA Newsletter Articles	Update industry and growers on project progress and case studies  Showcase the project with government and influencers	Operational information	At least two pa	AUSVEG SA email list	AUSVEG SA	M&E plan  Open and click rate
Face-to-face meetings and phone contact	Encourage uptake of programme  Provide ongoing support to participants	Operational information	Ongoing as necessary	Resellers and Growers	AUSVEG SA and IPM Technologies	M&E plan
Case Studies	Showcase results of the project to demonstrate value of investment to HIA and levypaying growers	Showcase experiences of growers and advisors with the project.  Showcase results from trials.	Finalised by end of project	AUSVEG SA email list.  National Vegetable Extension Network  AUSVEG national communications  Hort Innovation grower communications	AUSVEG SA	Clicks and downloads



## 8. Evaluating Success

How will you know if you have succeeded and met the communication objectives? How are you going to evaluate your success, what performance indicators and evaluating measures will you use.

Note: this project has a separate M&E plan. The evaluation below only measures the success of communication methods and not project outputs.

Objective	Outcome	Measurement Method	Target
1. Adoption	Number of participating advisors	Internal database of details	10 pa
	Number of participating growers	Internal database of details	5 pa
2. Utilisation	Email analytics	MailChimp	
3. Awareness	Number of media mentions for project	Media Monitoring	1 pa