Horticulture Innovation Australia

Final Report

2015 Global Innovations in Horticulture Seminar

Richard Mulcahy
AUSVEG Ltd

Project Number: VG13116

VG13116

This project has been funded by Horticulture Innovation Australia Limited using the vegetable industry levy and funds from the Australian Government.

ISBN 0 7341 3608 0

Published and distributed by:
Horticulture Innovation Australia Limited
Level 8, 1 Chifley Square
Sydney NSW 2000
Tel: (02) 8295 2300
Fax: (02) 8295 2399

Project Number: VG13116 **Date of Report: 28/07/2015**

Author: Stefan Oberman

Project leader: Richard Mulcahy – AUSVEG Ltd

Level 2, 273 Camberwell Rd, Camberwell VIC 3124
Ph: (03) 9882 0277
Fax: (03) 9882 6722

The 2015 Global Technologies in Horticulture Seminar served as a mechanism for vegetable growers to identify new farming technologies that could reduce their costs of production, increase efficiencies and ultimately lead to a more sustainable and competitive business.

Technologies presented at the Seminar may assist in improving the effectiveness, efficiency and economic viability of the Australian vegetable industry.

The purpose of this report is to collate Seminar feedback and develop recommendations intended to guide and improve the design of future 'Global Innovations' Seminars.

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

Table of Contents

Media Summary 4
1.0 Introduction 5
2.0 Seminar Details 7
3.0 Method 8
4.0 Outputs 9
5.0 Expected Outcomes 11
6.0 Industry Adoption 11
7.0 Results 13
7.1 Media Coverage 13
7.2 Attendee Feedback – Data 17
7.3 Attendee Feedback – Comments 23
7.4 Excerpts from Seminar Minutes 25
8.0 Evaluation of Results 26
9.0 Recommendations 28
10.0 Appendices 30
Appendix 1 – Floor plan of the Marquee room at Jupiters Gold Coast 30
Appendix 2 – Seminar Programme 31
Appendix 3 – 2015 Global Technologies in Horticulture Seminar Minutes 36
Appendix 4 – Feedback Form 42
Appendix 5 – Selected Media Clippings 45
Appendix 6 – Demographics of Attendees 53
Appendix 7 – Post-seminar Dissemination of Content 54
Appendix 8 - Seminar Flyer 55
Appendix 9 – Seminar Photographs 56

Media Summary

The 2015 Global Technologies in Horticulture Seminar was held on Thursday 25 June at Jupiters Gold Coast. The Seminar was designed to assist Australia's horticulture industry tackle current and future challenges showcasing new opportunities for levy investment and promoting collaboration between vegetable producers and researchers on a global scale. The Seminar hosted over 100 vegetable growers from across Australia and assembled a delegation of eight international horticulture innovators to showcase the very latest in global horticultural technology.

The Seminar acted as a forum for vegetable growers to identify opportunities for future industry investment. Widespread interest was generated by Steinar Henskes' bird deterring laser technology from the Netherlands, which also attracted strong media coverage for the Seminar. Dr John Corbett, from aWhere Inc. based in Colorado, USA, discussed precision climate prediction and leveraging 'Big Data' in order for growers to pinpoint optimal harvesting windows. Dr Corbett's climate prediction methodology was seen as quite ground breaking and has the potential to allow vegetable growers to better adapt to Australia's unpredictable climate while providing unprecedented field level intelligence.

The Global Technologies in Horticulture Seminar promoted dialogue between researchers and growers, with Co-Chairs, The Hon Paul Calvert and Mr Tom O'Meara facilitating a Q&A session between the speakers and audience following the presentations. A number of questions were asked by growers regarding how and when they may be able to incorporate some of the technologies discussed by the speakers into their own growing operations.

The Global Technologies in Horticulture Seminar exhibited research and technological innovations new to many Australian vegetable growers. The assembly of over 100 vegetable growers which had the common goal of increasing productivity and embracing new techniques, emphasised the significance of future planning for Australia's vegetable production industry. Increasing industry knowledge of global research and the availability of new technologies will assist growers in making long-term business decisions.

The Global Technologies in Horticulture Seminar illustrated a whole-industry initiative to support the adoption of technological innovation and promote enhanced collaboration between industry and researchers. The substantial grower participation demonstrated an industry-wide commitment to increasing productivity. The impact of this Seminar will resonate throughout Australia's vegetable industry for some time, encouraging growers to consider overcoming challenges by leveraging new horticultural technologies from across the globe.

Participant feedback was overwhelmingly positive with every delegate who responded to the question "*would you consider attending another Global Technologies in Horticulture Seminar or similar event again?"* answering 'yes'. In addition, 96 percent of delegates found the Seminar to be 'worthwhile' or 'very worthwhile'.

All Australian states were represented at the Seminar, with Queensland and Victorian delegates making up just over half of all participants. A significant number of delegates from Tasmania, Western Australia and South Australia were also present, with a small number of growers from the Northern Territory also in attendance.

1.0 Introduction

The 2015 Global Technologies in Horticulture Seminar was developed from the highly successful 2011 Mechanisation Seminar, 2012 Future Technologies Seminar, 2013 Emerging Technologies in Horticulture Seminar and 2014 Produce Innovation Seminar.

Australian growers have a long history of adopting new technologies and on-farm practices that has earned the industry a reputation for being one of the cleanest, safest and most efficient in the world. However, achieving profitable results for Australian growing operations continues to be a challenge facing the industry.

In Australia, high costs of production have contributed to tighter profit margins, with growers competing both on price and volume.

It has become clear that increasing the volume of consumption is not the only way to increase profitability. Greater integration and understanding of farming technologies is also needed to lower operational costs and increase yields, which will ultimately lead to higher profits for growers.

As a result of this, the 2015 Global Technologies in Horticulture Seminar showcased the most innovative breakthroughs in growing technologies to increase farm profitability and productivity. One of the aims of the Seminar was to increase the industry's knowledge and awareness of technology currently (or soon to be) available on the global market. The availability of these technologies was a critical focus of the Seminar and will allow growers to be in a better position to develop long-term, forward thinking business strategies for their own operations.

Through AUSVEG's ongoing engagement with key Australian vegetable growers, industry bodies and R&D specialists, significant interest was shown in technological innovations occurring in the USA, the Netherlands and Israel, among other places.

Innovative technologies from these countries were a key focus of the Seminar, with each of the speakers having an intimate knowledge of their country's vegetable industry. While the Seminar showcased technologies of the selected overseas markets, there was also an opportunity for open dialogue between speakers and attendees on how to best adapt and adopt these technologies for the Australian market.

Since the 2011 Mechanisation Seminar, the annual event has continued to grow significantly, with this year's Seminar again attracting over 100 delegates. Attendance has built on the 25 growers that participated at the 2011 Seminar and the 50 growers at the 2012 Future Technologies Seminar with the 2013 Emerging Technologies in Horticulture Seminar and 2014 Produce Innovation Seminar both attracting 100 growers.

The 2015 Global Technologies in Horticulture Seminar was not only a forum for discussing ways to increase profitability for growers, but also a forum for identifying future areas of R&D investment for the industry.

The venue selected for the Seminar was Jupiters Gold Coast and was chosen for its world-class facilities, competitive room hire rates and attractive location that resulted in an increase in grower participation.

Overall sentiment towards each of the eight speakers was relatively high, with Blair Richardson from the US Potato Board and Steinar Henskes from Bird Control Group proving to be the most engaging and relevant speakers, according to participant feedback surveys.

This year's Seminar also garnered significant media attention across print, radio and online, with a combined audience of over 630,000 people reading or hearing about the Seminar.

Image 1: Mr Tom O'Meara, Co-Chair of 'Group 1' facilitates discussion and dialogue among attendees in the Marquee venue.

Image 2: Delegates and observers are welcomed to the 2015 Global Technologies in Horticulture Seminar.

2.0 Seminar Details

The 2015 Global Technologies in Horticulture Seminar was held at Jupiters Gold Coast on Thursday 25 June. The Seminar was held on the same week as the 2015 National Horticulture Convention, minimising growers' time away from their operations and any possible disruptions to their business, while also affording them the best chance to get value from attending multiple complementary events.

Due to the substantial response from interested vegetable levy payers and the inclusion of Vegetable Advisory Committee members, arrangements were made for 100 delegates to attend. As a result, the Seminar was divided into two concurrent sessions (see **Figure 1** below) in the Marquee and Coolangatta rooms respectively (see **Appendix 1** for a floor plan of the room).

Each session had a Chair present in order to ensure the sessions ran smoothly and to facilitate the panel discussion and Q&A sessions. The Q&A sessions were held after each session and provided attendees with the opportunity to seek clarification on any presentations from the previous four speakers, as well as delve deeper into the ideas shared and what benefits could be achieved.

Morning tea was provided for attendees prior to the Seminar, as well as hospitality following its completion. This allowed attendees to meet each other before the Seminar, as well as meet the speakers and discuss what was presented after the sessions.

Time – Group 1	Event – Group 1	Time – Group 2	Event – Group 2
10:30am – 11:00am	Morning Tea and registration	10:30am – 11:00am	Morning Tea and registration
11:00am – 11:10am	Introduction by Tom O'Meara	11:00am – 11:10am	Introduction by Paul Calvert
11:10am – 11:30am	Jan Bontsema	11:10am – 11:30am	David Rosenberg
11:30am – 11:50am	John Corbett	11:30am – 11:50am	Roger Tripathi
11:50am – 12:10pm	Blair Richardson	11:50am – 12:10pm	Tara McHugh
12:10pm – 12:30pm	Rivka Offenbach	12:10pm – 12:30pm	Steinar Henskes
12:30pm – 1:10pm	Panel Q&A	12:30pm – 1:10pm	Panel Q&A
1:10pm – 2:00pm	Joint lunch	1:10pm – 2:00pm	Joint lunch
2:00pm – 2:10pm	Introduction by Tom O'Meara	2:00pm – 2:10pm	Introduction by Paul Calvert
2:10pm – 2:30pm	David Rosenberg	2:10pm – 2:30pm	Jan Bontsema
2:30pm – 2:50pm	Roger Tripathi	2:30pm – 2:50pm	John Corbett
2:50pm – 3:10pm	Tara McHugh	2:50pm – 3:10pm	Blair Richardson
3:10pm – 3:30pm	Steinar Henskes	3:10pm – 3:30pm	Rivka Offenbach
3:30pm – 4:10pm	Panel Q&A	3:30pm – 4:10pm	Panel Q&A
4:10pm – 4:20pm	Conclusion	4:10pm – 4:20pm	Conclusion
4:20pm – 5:30pm	Post-seminar hospitality	4:20pm – 5:30pm	Post-seminar hospitality

Figure 1: 2015 Global Technologies in Horticulture Seminar running sheet.

3.0 Method

The 2015 Global Technologies in Horticulture Seminar was designed and planned in accordance with the VG13116 project contract and informed by recommendations from previous Seminar reports. As per the project submission, activities to be undertaken within the project were:

- Convene a seminar to bring together all relevant industry stakeholders, including growers, Design Team and Vegetable IAC members, to learn about and discuss new horticultural technologies and innovations applicable to the Australian vegetable industry. The 2015 Global Technologies in Horticulture Seminar will be held at a location to be determined by AUSVEG, with suitable facilities for an event of such size and nature. The Final Report, including detailed recommendations, will be submitted to HIA by 31 August 2015.

- Film speaker presentations and disseminate information presented at the Seminar to Australian vegetable growers and the wider industry.

- Produce a final report containing all relevant information relating to the 2015 Global Technologies in Horticulture Seminar to be submitted to Horticulture Innovation Australia (HIA) and circulated to all relevant industry stakeholders.

The method for facilitating the 2015 Global Technologies in Horticulture Seminar was broken down into the following steps:

1. Choose topics and set an agenda.
2. Present draft topics to Vegetable IAC Sub-Committee for approval.
3. Identify and contact potential speakers for the approved topics.
4. Invite industry participants.
5. Disseminate information about the (upcoming) seminar, including promotional material about the content to be covered/discussed.
6. Liaise with all participants to make travel arrangements.
7. Make all necessary arrangements with the venue.
8. Develop seminar notes capturing discussions for future use.
9. Utilise all project related materials to develop the final report.
10. Submit final report to HIA by 31 August 2015.

As per the project contract, experts were sought from around the globe to provide an in-depth snapshot of their industry.

As outlined in the Outputs section of this report, speaker presentations and seminar notes were disseminated to growers and the wider industry, while Vegetable Advisory Committees have begun discussions regarding potential investment programmes resulting from the Seminar.

4.0 Outputs

The following materials have or will be circulated through AUSVEG's distribution methods following the Seminar's completion. This has ensured that growers who were unable to attend the Seminar will still be able to make use of the information presented and fully utilise the investment of levy funds.

- **Promotional material.**

In the months leading up to the Seminar, AUSVEG disseminated a broad range of information regarding the content and purpose of the event, and encouraged vegetable levy payers who were interested in attending to submit expressions of interest.

- **The Seminar programme.**

Disseminating the Seminar programme (see **Appendix 2**) allowed growers, industry representatives and interested researchers who were unable to participate to still see the topics that were identified and discussed.

This information will also assist in planning future events, as it will be clear which topics have already been covered.

- **Speaker presentations and video recordings capturing the ideas raised and discussed at the Seminar.**

Video footage of all speaker presentations has been made accessible to levy payers through the AUSVEG website. Video footage of all discussions and Q&A sessions have also been made available.

Seminar minutes and notes have been provided to the Vegetable Advisory Committee for the development of potential future projects. Minutes and notes have also been made available in this report (see **Appendix 3**).

- **Feedback opportunities for participants.**

Attendees were given the opportunity to provide formal and confidential feedback through an attendee feedback form distributed at the Seminar. The feedback form allowed attendees to provide opinions on the topics, speakers, and which aspects of the Seminar they did or did not find beneficial. Feedback obtained will be used to design and plan future Seminars and events.

- **Final report summarising the outcomes of the Seminar including detailed recommendations for potential future investments.**

A final report (this document) has been prepared and submitted to Horticulture Innovation Australia. This report incorporates details of the event, findings of the participant survey and potential ideas for future R&D projects arising from the event.

Upon approval of this report by HIA, it will be made available to levy payers and advertised to relevant parties through AUSVEG's communication channels including *Vegetables Australia* and the Weekly Update email. Seminar attendees may also be interviewed for the annual 'Grower Success Stories' booklet, which is compiled to demonstrate successful applications of levy-funded R&D by growers.

Investment programme

HIA convened a meeting of the Vegetable Advisory Committee on Friday 26 June after the Seminar to discuss the ideas presented in the Seminar and begin developing future projects. Seminar presentations could serve as the basis for the development of a series of new project concepts and to develop an investment programme from new projects to be devised in the coming years.

Image 3: Delegates thank Dr Jan Bontsema for his presentation on robotic vegetable harvesting.

Image 4: Grower investigates Steinar Hemstad's bird control laser technology.

5.0 Expected Outcomes

The primary objective of the 2015 Global Technologies in Horticulture Seminar was to provide the vegetable industry with a greater level of awareness and understanding of new horticultural innovations and technologies, which, if utilised, could enable vegetable growers to improve the efficiency, productivity and competitiveness of their vegetable growing operations. This may assist vegetable growers to make better informed decisions pertaining to their business in the short, medium and longer-terms.

The immediate objectives of this project were achieved by providing Australian vegetable levy payers with direct access to, and engagement with, a range of leading international experts, who possessed a high level of knowledge in the field of horticultural innovation and technology.

A key outcome of this project for industry will be a heightened awareness and understanding of the new technologies and innovations that are currently available, or are being developed, and which could potentially lead to enhanced industry productivity, efficiency and competitiveness.

By offering participation in the Seminar to a broad range of vegetable levy payers, AUSVEG sought to ensure that a significant number of vegetable growers were able to learn about new innovations applicable to their business. As an industry, there is a recognised need for growers to be provided with opportunities for education on farming innovations and technologies. Encouraging participation in the Seminar from a diverse group of vegetable growers also ensured that there was a greater pool of growers who will consider adopting beneficial new global farming technologies and innovations into their own businesses. Innovations discussed during the Seminar may also potentially feed into future vegetable R&D investments and/or project concepts.

At the Seminar's conclusion, a delegate feedback form (see **Appendix 4**) was completed by attendees. This was used to gauge opinions and measure the overall success of the event. The information provided in these forms was used to formulate relevant recommendations in this report and will be used to design future seminars. Informal conversations with attendees were also held which will help form future programmes.

6.0 Industry Adoption

Industry engagement was achieved through utilising AUSVEG's communication channels and grower networks to promote the findings and outcomes of the Seminar. AUSVEG communicated with growers through multiple channels to ensure that insights from the Seminar are accessible to all growers.

Feedback from the Seminar survey was collated and is presented in this Final Report which will be made accessible to the Vegetable Advisory members responsible for formulating projects and recommending the investment of levy funds. In this way, the Seminar will provide guidance for the future investment of levy funds.

Image 6: AUSVEG CEO Richard Mulcahy greets delegates during post-Seminar hospitality.

Image 7: Delegates engage with speakers following the Seminar's conclusion.

7.0 Results

7.1 Media Coverage

Media is a highly effective and valuable tool for communicating R&D news and updates to the industry and wider Australian population. Those who were unable to attend the 2015 Global Technologies in Horticulture Seminar were able to gain an insight into the aims and results of the Seminar through the high degree of media coverage that the Seminar garnered. Additionally, public awareness of the Australian vegetable industry's ambitions to continually progress and remain a world leader were reinforced.

The 2015 Global Technologies in Horticulture Seminar received widespread media attention in the lead-up to, on the day of, and after the event. A large number of print media outlets around the country made mention of the seminar including; *The Ballarat Courier, The Land, Queensland Country Life, The Daily Examiner, The Advocate, The Weekly Times*, and *Stock & Land.*

Significant radio coverage was achieved, with the Seminar co-ordinator, Stefan Oberman, speaking on 3WM Horsham, 2SM, and ABC Radio National. In addition, ABC Gold Coast FM interviewed several of the Seminar's speakers with David Rosenberg and Steinar Henskes providing extensive interviews.

During the Seminar, Channel Nine News – Gold Coast interviewed a number of Seminar speakers as well as AUSVEG staff who discussed advancements in horticulture R&D.

Media coverage and reach generated by the seminar was substantial, with the combined circulation of print, radio and online media reaching well over 630,000 people.

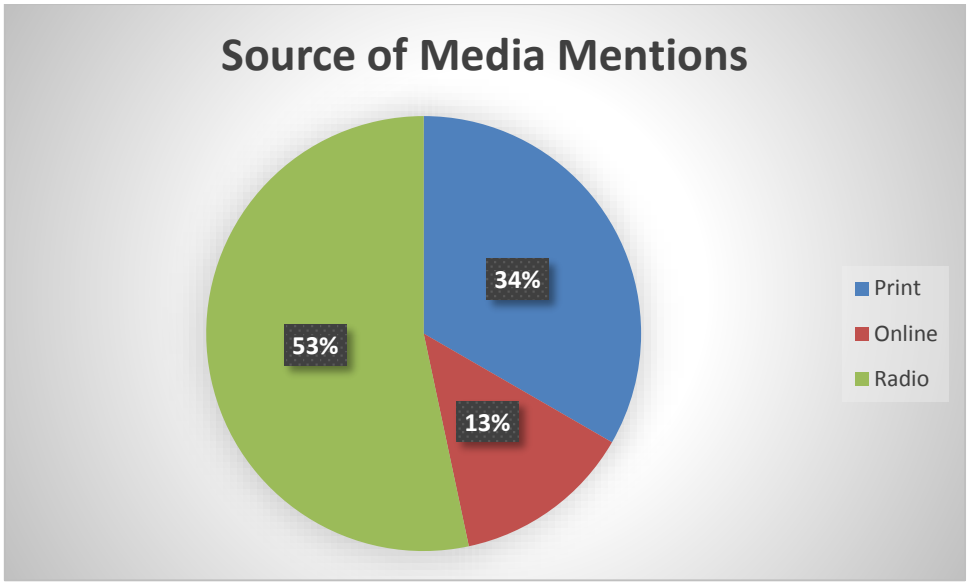


Figure 2: The above graph shows media sources that mentioned the 2015 Global Technologies in Horticulture Seminar.

Media Type	Mentions	Circulation/Audience
Online	2	300,000
Print	5	209,857
Radio	8	42,000
TV	1	80,000
Total	**16**	**631,857***

Figure 3: The above table gives a further breakdown of media sources and circulations. *Some radio and online sources do not make their circulation and audience figures available, however, every attempt was made to contact each network to acquire their listenership or readership numbers, even if they are not officially published. The figures noted in the above table are conservative in nature with the Seminar most likely generating even more exposure among simulcast networks such as News Ltd and Fairfax.

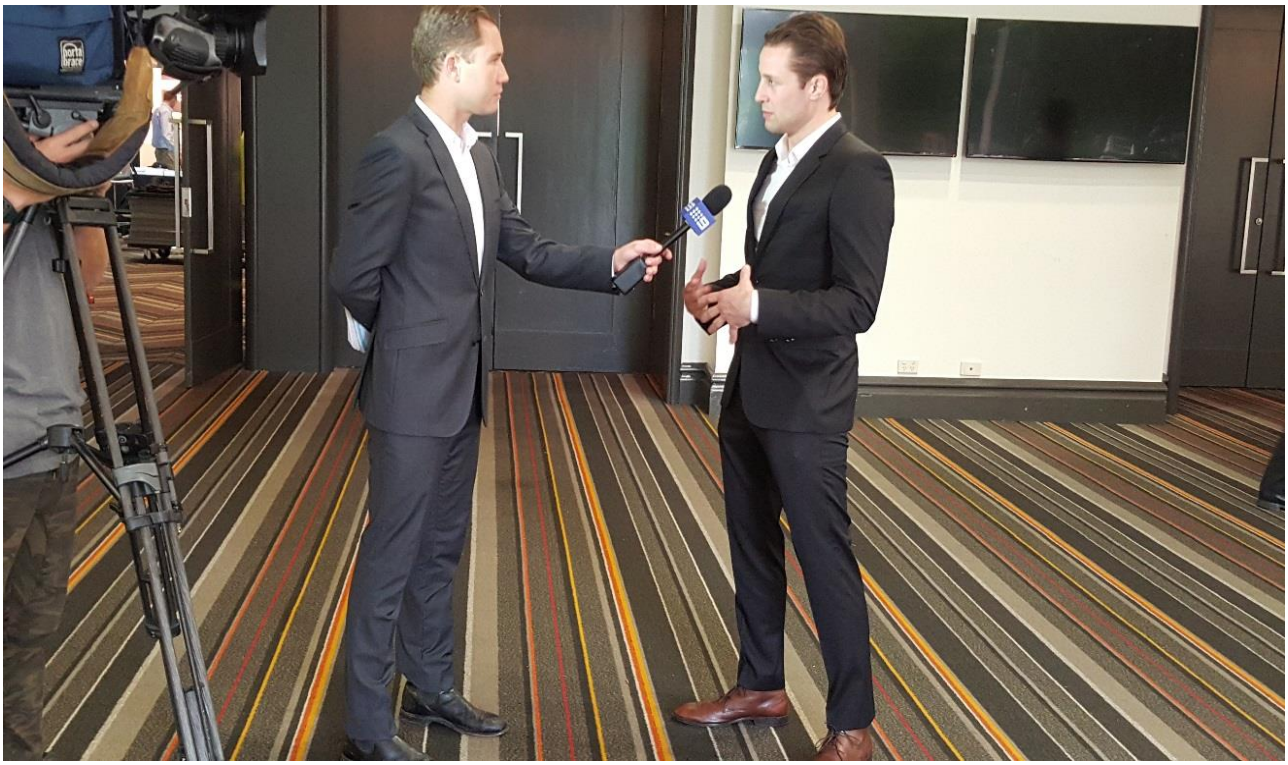


Image 8: Mr Steinar Henskes of Bird Control Group speaks with Channel 9 Gold Coast.

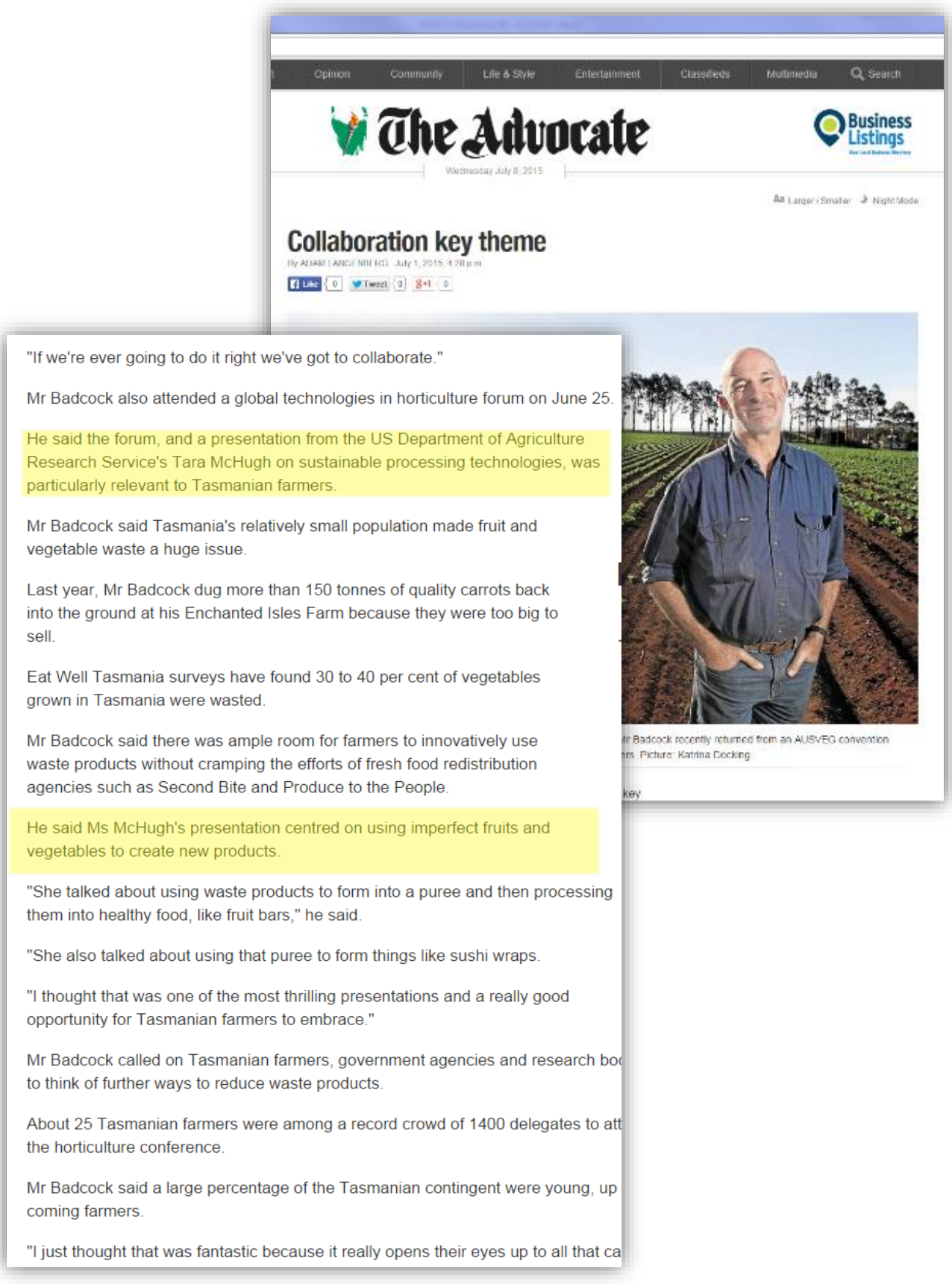


Image 9: Seminar participant, Michael Badcock, praises the relevancy of the Seminar to the industry.

Sites

ABC

Rural

Home | Horticulture | Livestock | Fibre | Grains | Mining | Add Industry | Weather | Markets

Innovation for the industry on show at National Horticulture Convention

QLD Country Hour By David Sparkes , Marty McCarthy and Jodie Gunders

Print | Email | Facebook | Tweet 38 | More 13

Updated 26 Jun 2015, 12:25pm

A group of innovative horticulture experts from around the world have descended on Queensland's Gold Coast to encourage Australian farmers to think beyond traditional farming and food processing methods.

Skyscraper farms, growing c
value adding to food waste, a
apps to arrange immediate tr
are just some of the technolo
by the speakers.

One of those was AeroFarms
officer, David Rosenberg, wh
company's work with vertical
States.

He said the vertical farming r
AeroFarms required no soil c
produced about 70 times mo
than traditional farming.

"Actually, we grow in wareho

"We are building our ninth fa

THE LAND

NEWS | CATTLE | SHEEP | CROPPING | OPINION | WEATHER | MA

HORTICULTURE GENERAL NEWS

Teching-up the hort landscape

27 May, 2015 09:15 AM A+ A-

LASER beams, robots and mid-air vegetable cultivation will be on the agenda for over 100 of the country's leading vegetable growers at the 2015 Global Technologies in Horticulture Seminar to be held on Thursday, June 25, at Jupiters Gold Coast.

The seminar aims to educate Australian growers on the futuristic technology they can employ on-farm, and builds on a highly successful series of annual seminars - facilitated by horticulture industry body

7.2 Attendee Feedback – Data

Seminar feedback forms were distributed to all attendees at the completion of the Seminar in order to gauge participant sentiment towards the Seminar, its content and value. Minutes were taken during the Seminar which included taking note of all questions and comments made by attendees, while a number of informal conversations were also held with attendees after the Seminar.

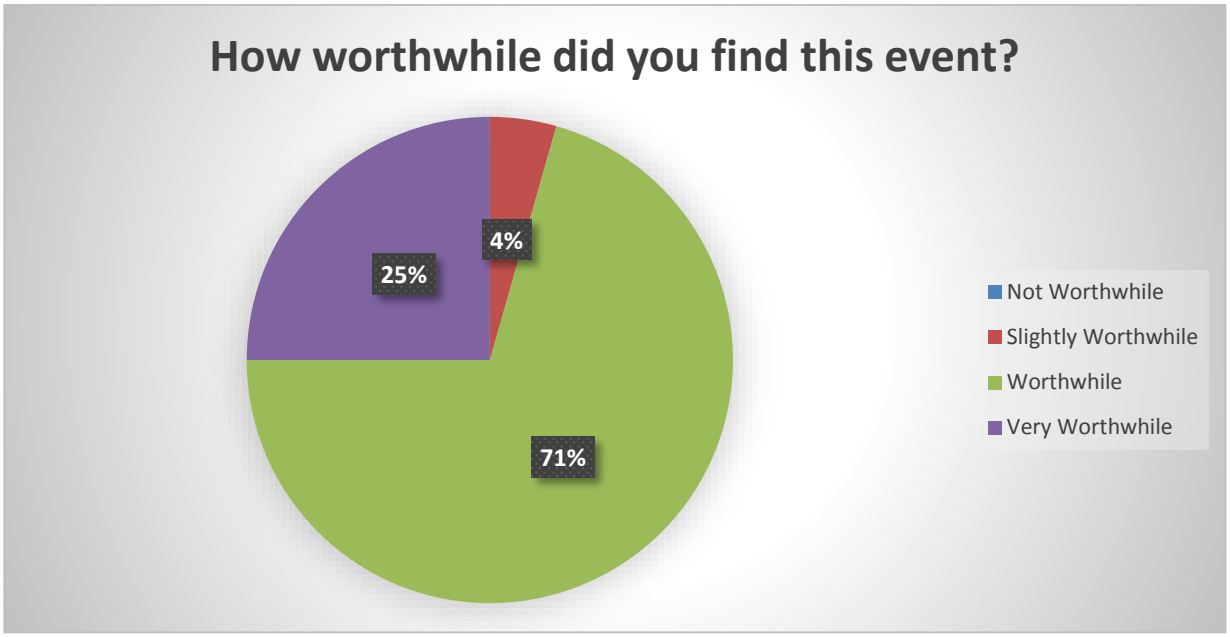


Figure 4: Attendees were asked how worthwhile they found the 2015 Global Technologies in Horticulture Seminar to be by selecting one of the following options: "Not Worthwhile", "Slightly Worthwhile", "Worthwhile" and "Very Worthwhile". Over 96 percent of attendees found the Seminar to be either "Worthwhile" or "Very Worthwhile", while no attendees found the Seminar to be "Not Worthwhile".

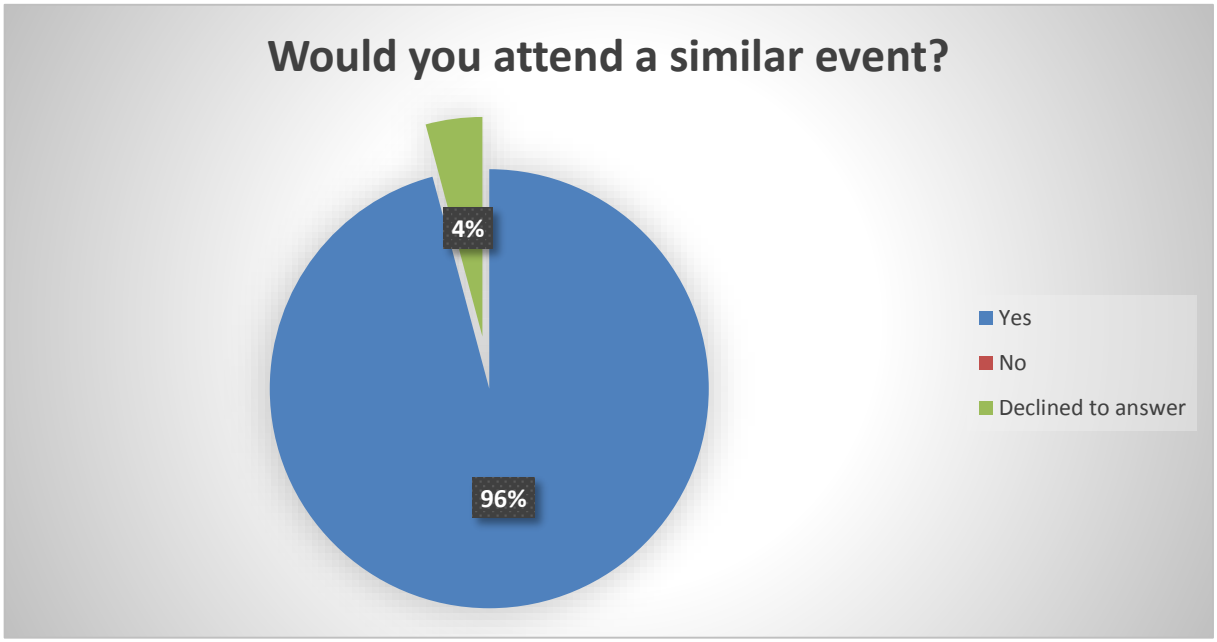


Figure 5: Attendees were asked if they would attend a similar event again. Every delegate who answered the question, answered 'Yes'.

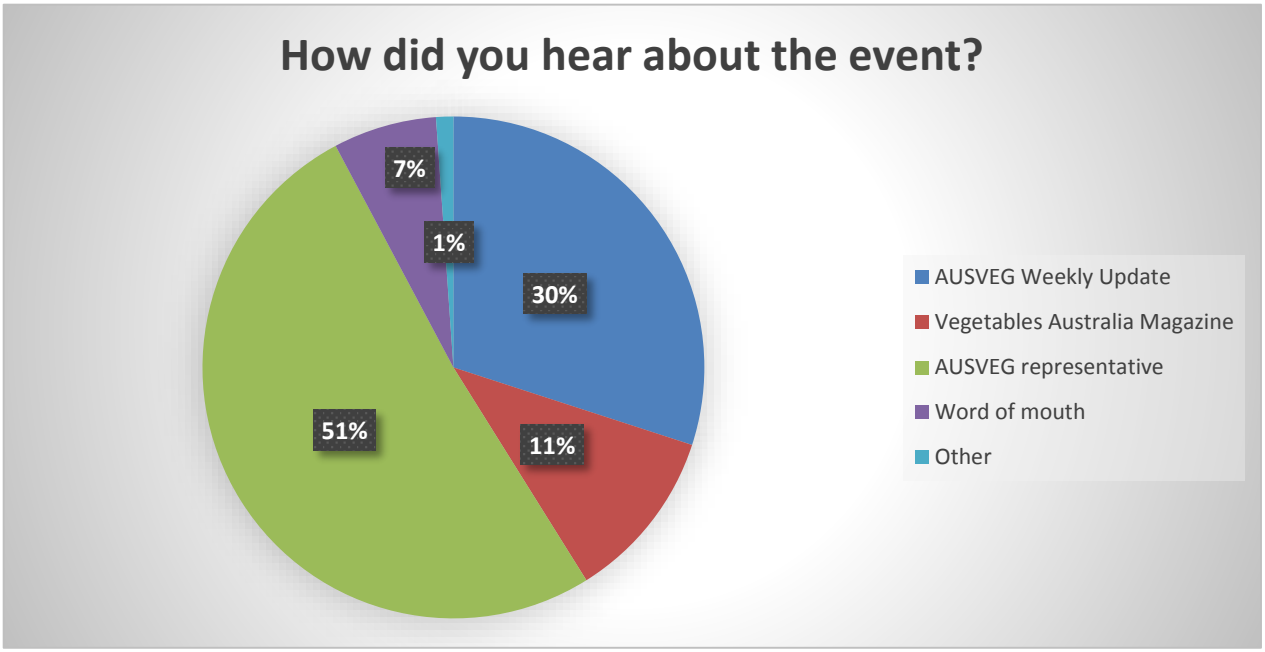


Figure 6: Attendees were asked how they heard about the 2015 Global Technologies in Horticulture Seminar. Fifty-one percent said they heard about it directly from an AUSVEG representative. Thirty percent of respondents said they had heard about the Seminar via the AUSVEG Weekly Update email. The remaining respondents said they heard about the Seminar via the *Vegetables Australia* magazine (11 percent), word of mouth (7 percent) or other (1 percent) sources.

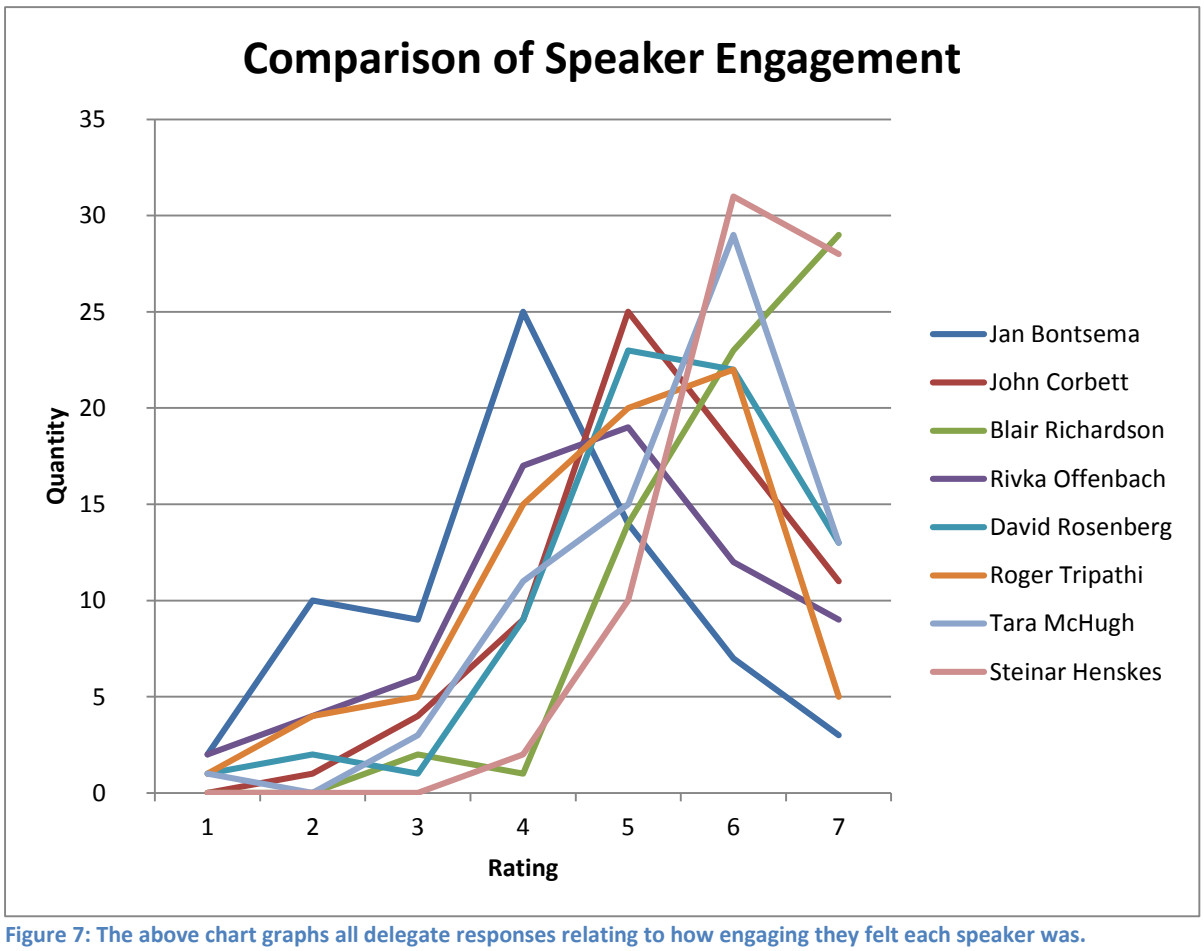


Figure 7: The above chart graphs all delegate responses relating to how engaging they felt each speaker was.

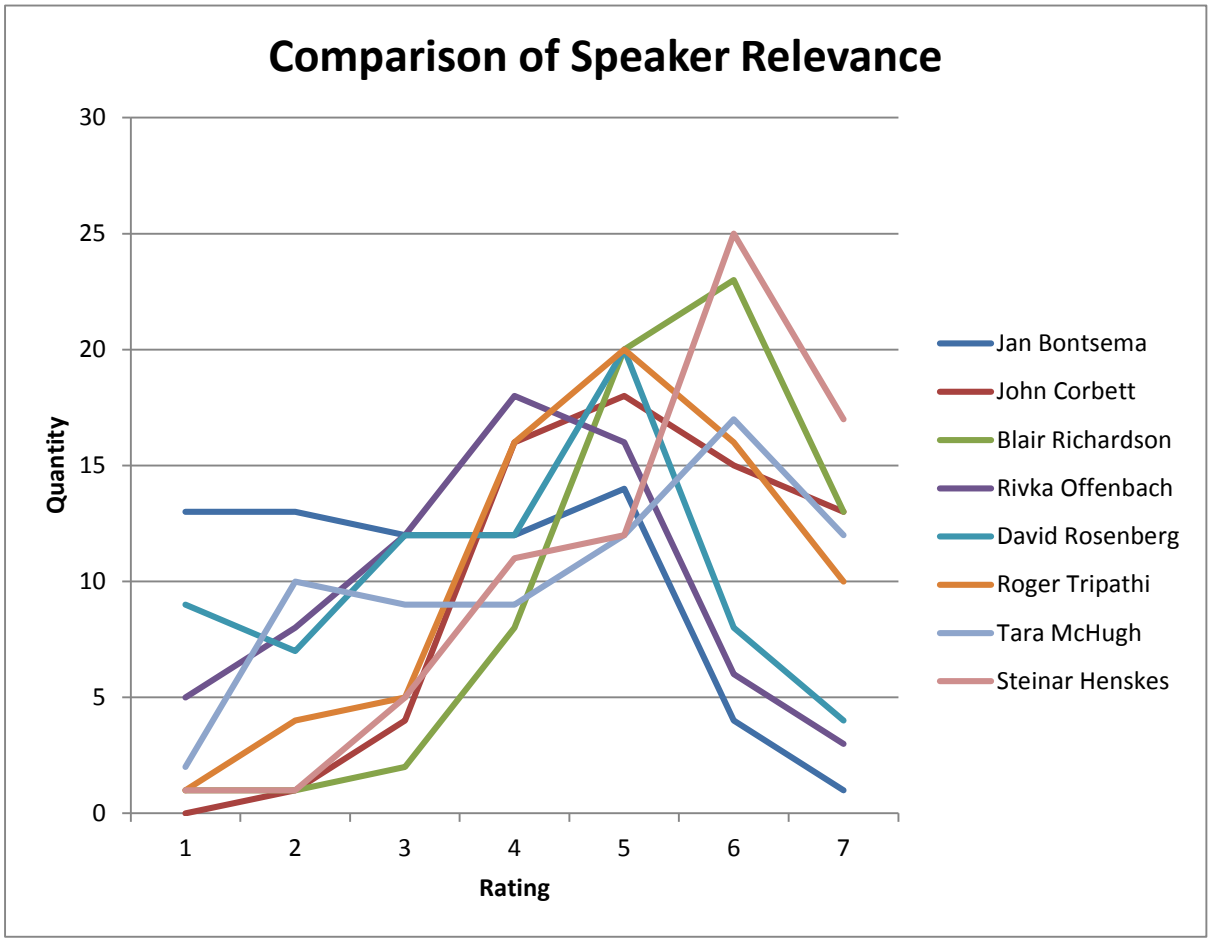
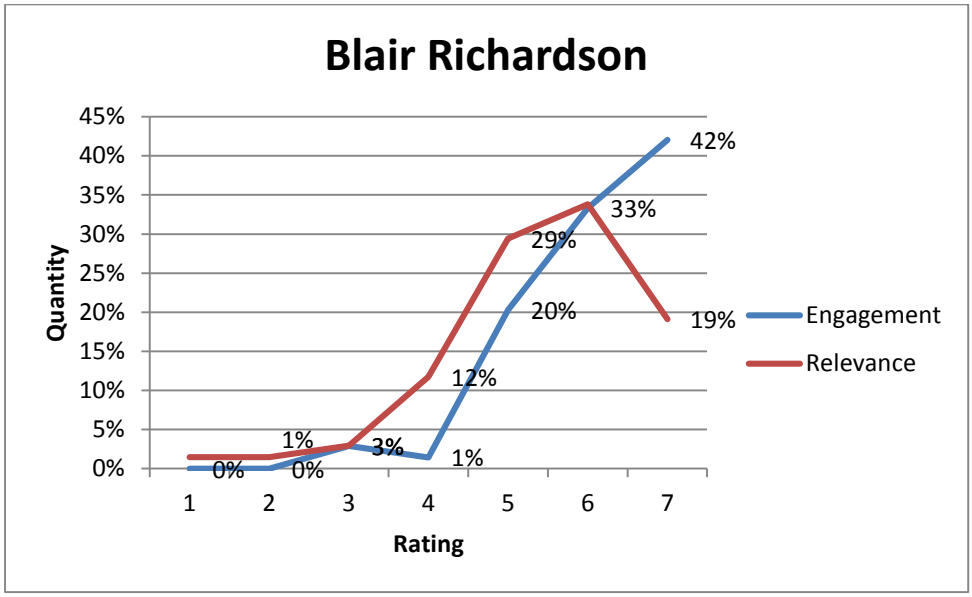
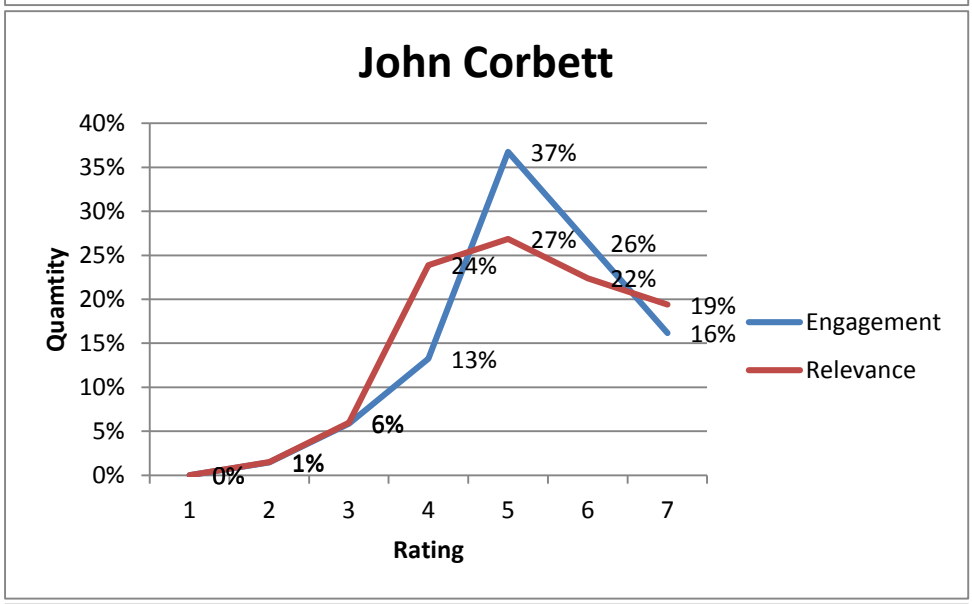
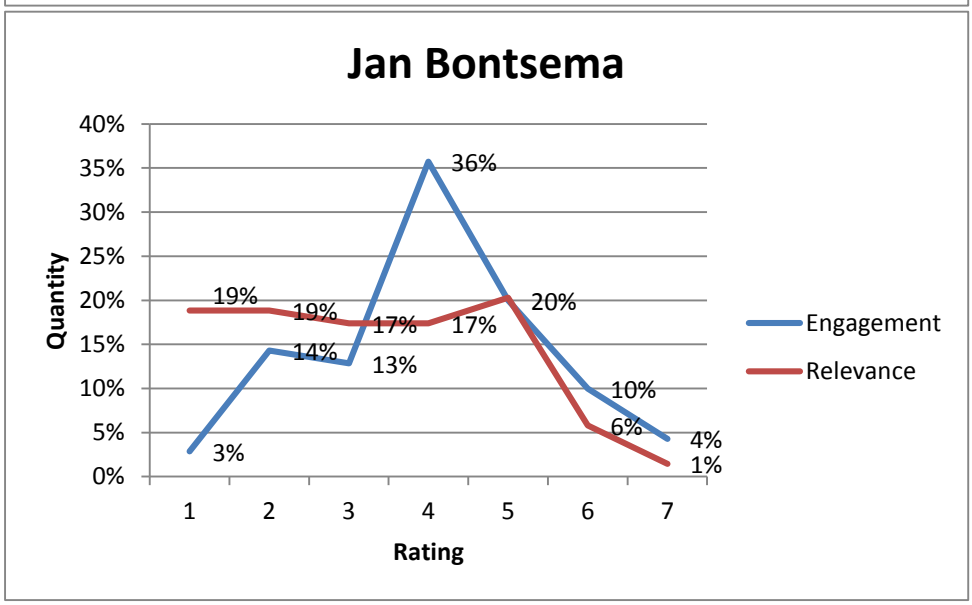


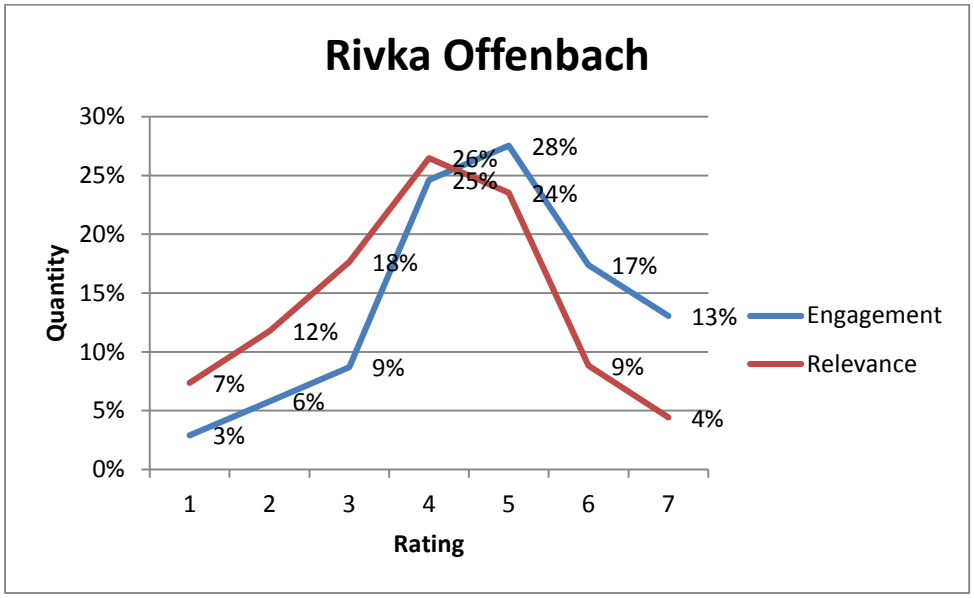
Figure 8: The above chart graphs all delegate responses relating to how relevant they felt each speaker was. Overall, the data is positively skewed towards ratings of 5 and 6.

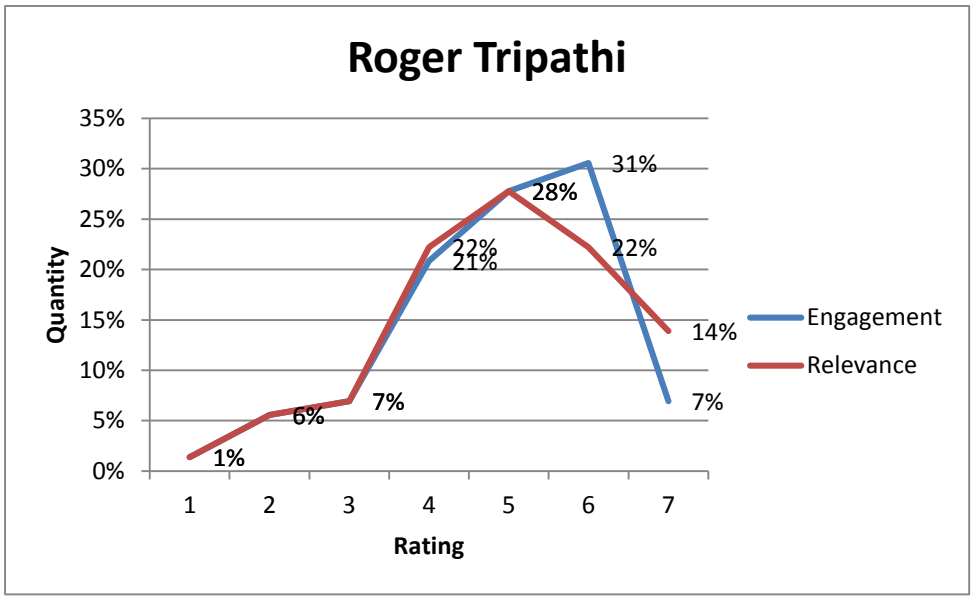
Figure 9: The following graphs measure audience feedback on individual speaker engagement and relevance.

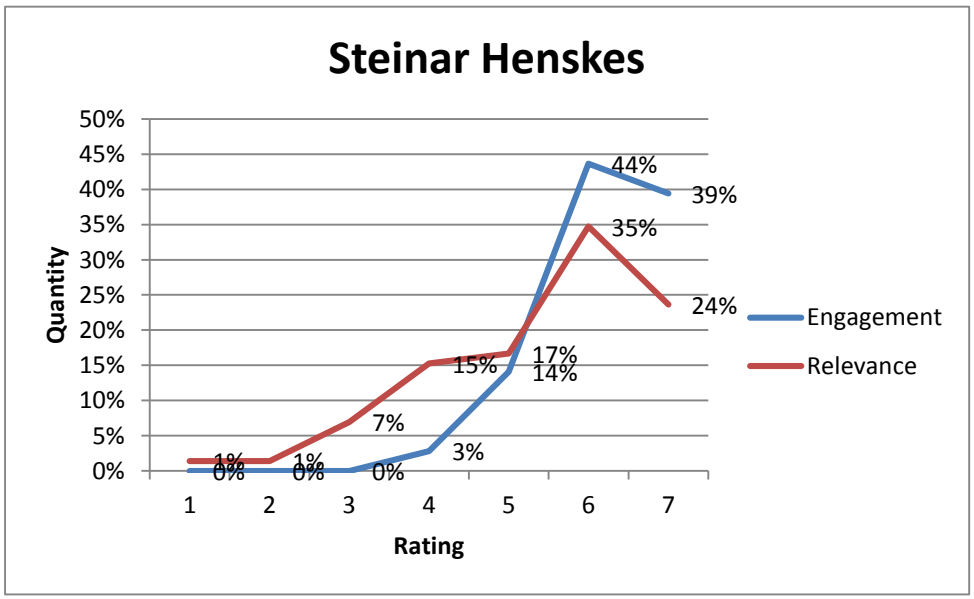


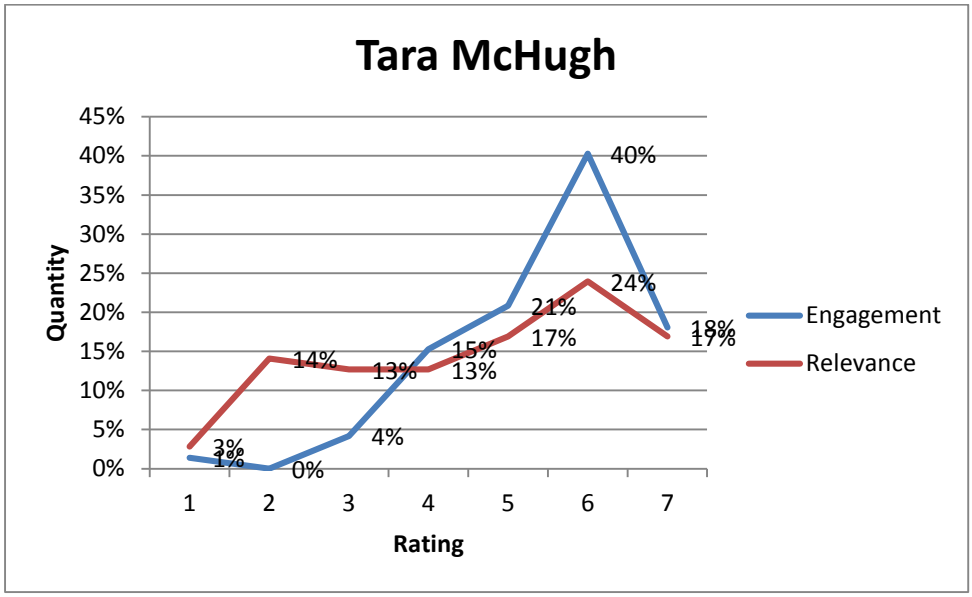


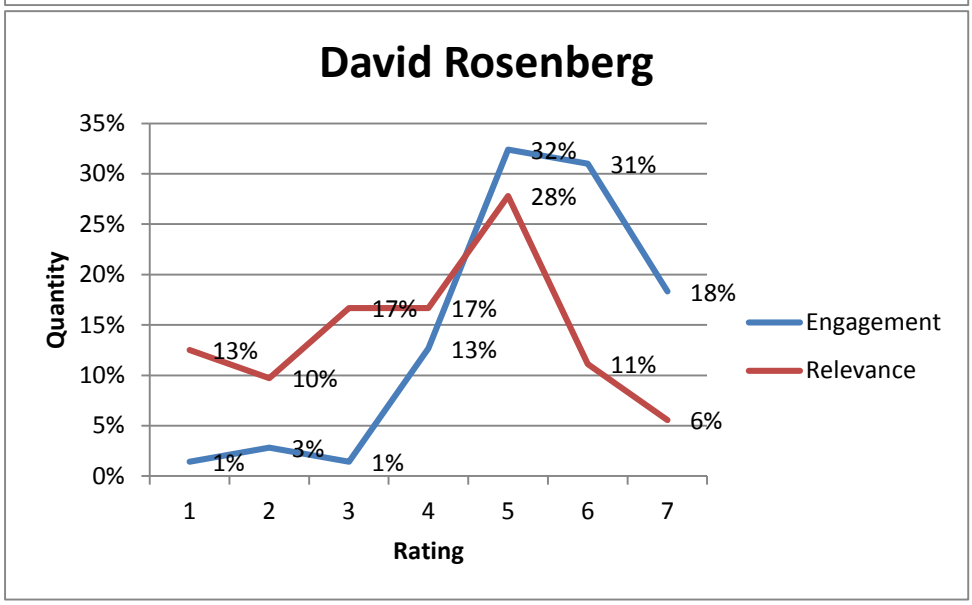



Rivka Offenbach
30%
25%
20%
15%
10%
5%
0%
Quantity
1
2
3
4
5
6
7
Rating
7%
12%
18%
26%
25%
24%
17%
13%
3%
6%
9%
9%
4%
28%
Engagement
Relevance


Roger Tripathi
35%
30%
25%
20%
15%
10%
5%
0%
Quantity
1
2
3
4
5
6
7
Rating
1%
6%
7%
21%
22%
28%
31%
22%
14%
7%
Engagement
Relevance


Steinar Henskes
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Quantity
1
2
3
4
5
6
7
Rating
0%
1%
0%
7%
15%
3%
14%
17%
44%
35%
39%
24%
Engagement
Relevance


Tara McHugh
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Quantity
1
2
3
4
5
6
7
Rating
40%
24%
21%
18%
17%
15%
14%
13%
13%
4%
3%
1%
0%
Engagement
Relevance


David Rosenberg
35%
30%
25%
20%
15%
10%
5%
0%
Quantity
1
2
3
4
5
6
7
Rating
32%
31%
28%
18%
17%
17%
13%
13%
11%
10%
6%
3%
1%
1%
Engagement
Relevance

7.3 Attendee Feedback – Comments

The following excerpts are responses to questions asking what delegates liked and what the organisers could do better next time, which were found on the Feedback Form (See **Appendix 4**). These excerpts have been considered when formulating the recommendations section of this report:

5) Was there something you liked or something we could improve for next time?

Excerpts from feedback forms.

"Very well done all round. Speakers were excellent."

"Sound system was average."

"Speakers and content was generally very good."

"Bird control presentation was fantastic – very practical!"

"Vertical farming – needed more info on how the whole process works."

"It was a very good idea to have the speakers talk for 20 minute periods as it helped the programme flow well – it was also enough time to take things in from each presenter."

"Great having the tables for levy payers to write notes on."

"Generally a great range of various speakers of a high calibre and reputation."

"Really liked Blair [Richardson's] and David [Rosenberg's] presentations."

"Big picture stuff was great! However, some of the very specific areas covered would only have relevance to a small percentage of the audience."

"This year's sessions were shorter and sharper than last year – the change was great!"

"Steinar Henskes and Tara McHugh were good. Please continue to have innovative products being shown."

"Very happy with topics – great speakers!"

"Roger Tripathi came across somewhat as a 'salesman'."

"Some very interesting speakers. Great work!"

6) Additional feedback:

Excerpts from feedback forms.

“The same font and background colours should be used on all speaker presentations.”

“As the speakers only had 20 minutes each to present, they should be limited in the number of slides they’re allowed to use.”

“The meeting Chair needed to be more up-to-date with what he was presenting”

“Need to create an environment which is less intimidating to ask questions – i.e. break the groups into even smaller groups.”

“There appeared to be some issues with the data projector set-up.”

“Videos used in presentations were excellent as they helped delegates to visualise what the speakers were talking about.”

“It would be good if speaker presentations could be accessed on phones during the presentation so that those sitting far-away from the projector can still read the smaller text.”

7.4 Excerpts from Seminar Minutes

The following excerpts are from the Seminar minutes (see **Appendix 3**). The quoted sections are discussion points raised by growers wishing to discover further information from speakers and relate findings to their own operations. These excerpts have been considered when formulating the recommendations section of this report:

Dr Jan Bontsema: "Robotic Harvesting of Fruit Vegetables"
It was asked if in future a robotic harvester will be fast enough to handle the commercial quantities of vegetables:

- It was said that the optimal cycle time for harvesting each piece of fruit is 6 seconds compared to 2 for humans, but robots can harvest 24 hours a day. A robot with a cycle of 12 seconds would be half as expensive to purchase.

Mr Steinar Henskes: "*Innovative technology for effective and animal-friendly bird control in horticulture"*
It was asked what effect the laser would have on farm animals that are near vegetable growing fields:

- It was said that cows/horses are not affected and that the laser has been trialled on a dairy farm with no adverse effect to the cows whilst still addressing the bird issue.

It was asked if a property is located next to an airfield, what regulatory process/hurdles must be jumped over:

- It was said that because the laser is low energy there are no regulatory hurdles, however in order to avoid issues it is essential to inform relevant authorities.

It was asked if the laser could effectively deter birds from entering into sheds and if it would be safe inside:

- It was said that this was possible, but more often this was done using a hand held unit or alternatively install an automated unit high in the shed and aim it at any areas where birds would sit/nests.

Dr Tara McHugh: "*New sustainable processing technologies to produce healthy, value-added foods from fruits and vegetables and their co-products"*
It was asked if there is a vitamin D effect on produce grown vertically:

- It was said that as the light can be controlled the nutritional profile is as good if not better than conventionally grown vegetables.

It was asked if carrot wraps and vegetable films could be used as edible packaging.

- It was said that this is possible and that films have been tried as sandwich wraps. It was said that cost is problematic and food wraps cost a lot more than synthetic packaging.

It was asked if UV can be used to reduce the use of chemicals and disinfectants in food products.

- It was said that there are particular spectrums of UV and that UVC could potentially be used to do this.

Mr David Rosenberg: *"Vertical farming, pitfalls and opportunities"*
It was asked if AeroFarms had investigated producing seed potatoes:

- It was said that given the expense involved the business has had to maintain a specific focus and at this stage that focus has remained on leafy veg. It was said that the aeroponic germination process is 12-48 hours compared to 8-10 days and as such this may have an application in the seed potato industry.

It was asked about AeroFarms' concerns for feeding the world and if the technology has been used to adapt vertical farming to vegetables other than leafy greens to more substantial products.

- It was said that there will be a future focus on other crops and that the company acknowledges that the world could not be fed on leafy greens alone. It was said the technology could also be used for herbs and microgreens.

Mr Roger Tripathi: "*Sustainable soil to shelf nutritional solutions – and integral part of ICM stress management, especially in Australian conditions*
It was asked if Cytozyme foresees any potential registration problems with their products.

- It was said that this isn't expected, and that quarantine is the biggest concern but will be addressed.

8.0 Evaluation of Results

Information gathered from Seminar feedback forms showed that, overall, attendees found the Seminar worthwhile, engaging and relevant. Every attendee who answered the question on their feedback form about their attendance at future Seminars said they would attend again, indicating that growers found the Seminar to be a valuable levy-funded project and a successful method of communicating R&D updates.

Comments from attendees indicated that the Seminar continued to be a beneficial event and one that has continued to improve since its inception.

Growers also found benefit in congregating with other growers and industry stakeholders to discuss issues that affect the entire industry and shared their thoughts on ways to move forward. Growers also felt that the Seminar provided "good networking opportunities".

It was suggested that some of the information presented by the speakers was not directly relevant to every delegate in attendance, however, it was also noted that it was beneficial to hear about "different aspects of the industry that growers don't usually hear much of".

In discussions held with growers after the Seminar, it became apparent that they had been inspired and provided with a positive sense of direction as a result of attending the Seminar. Several growers mentioned that they would be keen to start trialling some of the technological innovations discussed at the Seminar. It was also said that this year's Seminar presented information and technologies that could be implemented straight away, while previous seminars featured technology that was still being developed.

Image 11: Seminar Chair Tom O'Meara introduces Dr Tara McHugh.

9.0 Recommendations

The following recommendations are based on grower feedback, discussions with Seminar speakers, Seminar minutes and on-site observations. These recommendations should be taken into account when designing future seminars or similar industry projects.

1. **Hold a similar seminar in 2016.**

A similar seminar should be held in 2016 that continues to present leading innovations and technologies from around the world. Responses provided in Seminar feedback forms, and discussions held with attendees after the Seminar, show that growers find the event to be highly beneficial and useful in planning the future direction of their operations.

2. **Innovations and technology presented should be ready to implement.**

One aspect of this year's Seminar that growers found particularly beneficial was that information and technologies presented are effective immediately. While previous seminars have shown revolutionary technology, that technology may not be ready for use in the short to medium term.

Speakers and topics featured at future seminars should ensure that growers can benefit in the short to medium term from information presented in the Seminar and be able to implement new practices.

3. **Break down the session groups into smaller 'class sizes'.**

Several growers commented that they found the large 'u-shape' table configuration too daunting in respect to asking questions and engaging in dialogue with fellow delegates. For future seminars, it should be investigated if smaller group sizes could be created with delegates choosing beforehand which speakers they wanted to listen to. While this would mean that delegates most likely wouldn't be able to listen to all speakers, they would have more 'quality time' with the speaker or subject 'streams' that they choose to participate in.

4. **Use smartphones to read speaker presentations.**

In order to increase delegate engagement with the speakers' presentations, it is recommended that the speaker's PowerPoint presentations could be viewable on the screens of delegate smartphones. This would ensure that those with poor eyesight could still view the presentations.

5. **Provide more presentation screens.**

For future Seminars, it is recommended that more projectors or TV screens are set-up in the room in order for delegates to fully see the presentation, especially if they are not directly facing the stage.

6. **Speakers should be able to relate to a broad cross-section of vegetable growers.**

While there was almost unanimous approval for this year's speakers, any future Seminar should ensure that the subject matter of the speakers chosen is not too narrow. This will ensure that the broadest cross-section of vegetable growers can remain engaged throughout the day.

7. **Allow the Seminar to be broadcast as a live 'webinar'.**

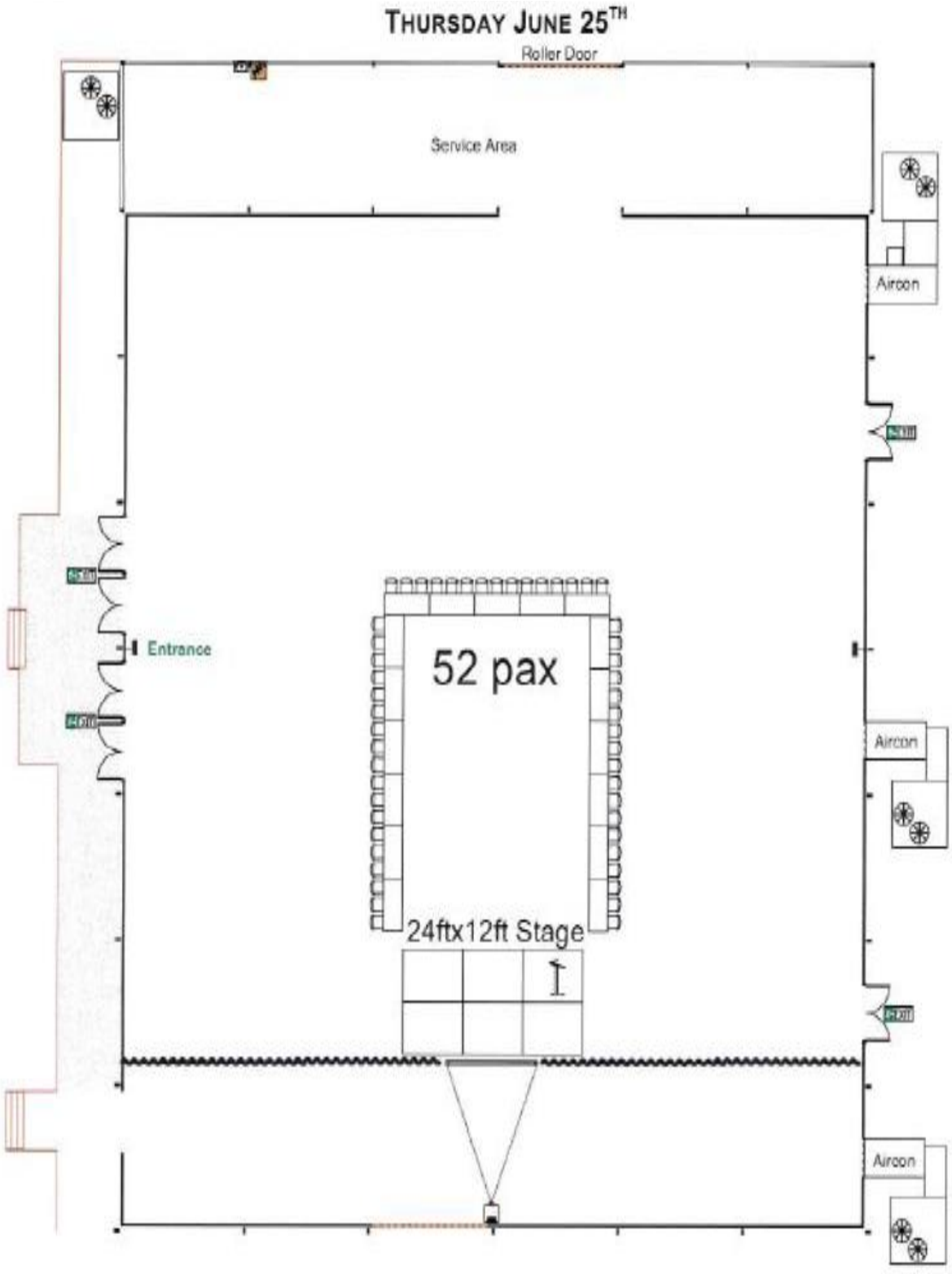
Generally, it is discouraged to have more than one or two growers from the same company attend the Seminar. This is so a diverse number of businesses have the opportunity to send representatives to the Seminar. As such, a number of vegetable growers missed out on attending. Given the availability of web-broadcasting technology, it is recommended that next year's seminar be broadcast live on the web, allowing growers with an internet connection to view the Seminar.

8. **Increase the number of levy funded positions to 125 places.**

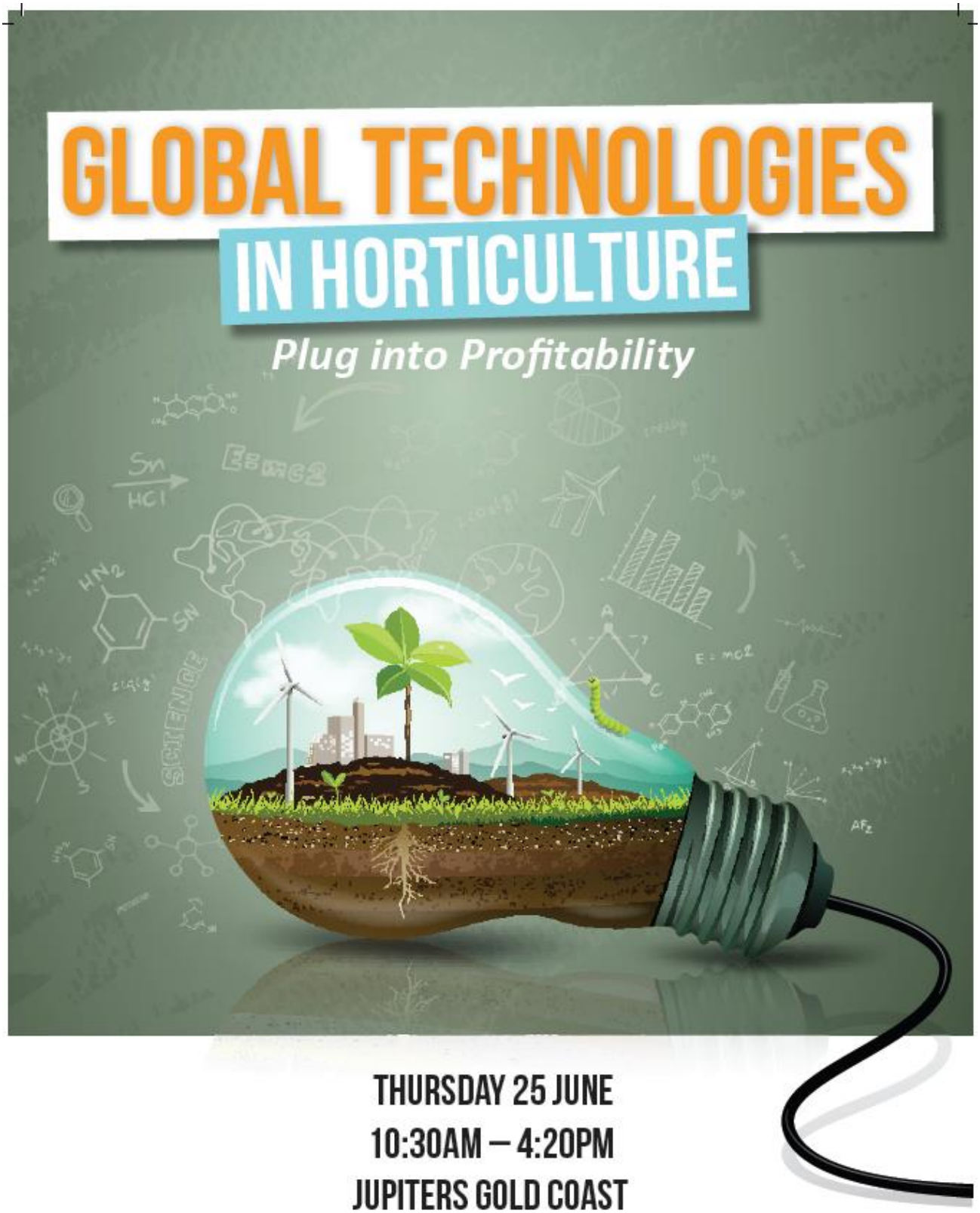
The 2015 Global Technologies in Horticulture Seminar had funding for 100 levy paying vegetable growers to attend. In 2016, if a similar seminar is run, there should be an additional 25 places made available for levy paying vegetable growers, as this year, demand outstripped supply.

10.0 Appendices

Appendix 1 – Floor plan of the Marquee room at Jupiters Gold Coast



Appendix 2 – Seminar Programme



GLOBAL TECHNOLOGIES IN HORTICULTURE

SPEAKER LIST

DR JAN BONTSEMA (Netherlands)

Senior Scientific Researcher | Wageningen UR, Greenhouse Horticulture

Topic: "Robotic Harvesting of Fruit Vegetables"

Jan Bontsema (1955, Groningen, The Netherlands) received his MSc in 1982 and his PhD in 1989, from the University of Groningen, both in Mathematics. He has held positions at the Universities of Delft, Groningen, and Wageningen, The Netherlands. Since 1997 he has worked as a Senior Scientific Researcher with Wageningen UR Greenhouse Horticulture. His research focusses on advanced mechanization in agriculture and greenhouse climate control. He was the coordinator of the EU-FP7 project CROPS (2010-2014). He is the coordinator of the EU-H2020 project SWEEPER (2015-2018). Furthermore he has been and is co-supervisor of 5 PhD students.

STEINAR HENSKES (Netherlands)

Founder | Bird Control Group

Topic: "Innovative technology for effective and animal-friendly bird control in horticulture"

Steinar Henskes (1991) had already sold a company twice at the age of 20. He is an inquisitive traveler of the world, ambitious entrepreneur and Dutch judo champion. Steinar studies International Business Administration at the University of Amsterdam. Since 2012 Steinar is a Kairos K50 fellow and Deloitte Technology Fast50 Rising Star. In 2015 he won the Global Student Entrepreneur Award.

His company, Bird Control Group, solves the conflict between humans and birds in more than 65 countries around the world. Customers include large multinationals, airports and governments in the following industries: aviation, oil & gas, agriculture, fishing and industrial sites & factories. The animal friendly solutions are recognized by the World Wildlife Fund and discussed in national parliaments. Bird Control Group is financed without external equity financing and is part of "Yes!Delft", the largest European tech incubator.

DR TARA MCHUGH (California, USA)

Research Leader | Agricultural Research Service
United State Department of Agriculture

Topic: "New Sustainable Processing Technologies to Produce Healthy, Value-Added Foods from Fruits and Vegetables and their Co-Products"

Dr. McHugh has authored over 105 peer reviewed publications and 9 patents. She has received a multitude of awards, including the Presidential Early Career Award in Science and Engineering and two USDA Secretary Honors Awards. She currently leads a research unit in the USDA, Agricultural Research Service. Novel food products developed by her lab, including 100% fruit and vegetable bars, edible fruit and vegetable films, and vitamin D enhanced mushrooms, are increasing specialty crop consumption in the U.S. and benefiting human health. Novel sustainable technologies are also saving energy and water, while increasing utilization of food waste. These topics and more will be unveiled in her presentation.

DR JOHN CORBETT (Colorado, USA)

President and CEO | aWhere Inc.

Topic: "Agile, localized, 'big data' and analytics to address production challenges under increased weather variability"

John Corbett's expertise is in location-intelligence and agricultural meteorology. With experience across the earth's agricultural areas and entrepreneurial roots, John continues to build and manage systems to utilize geo-analytics and localized agronomic 'smart content' to positively impact outcomes on-farm and across the agricultural value chain. John leads an innovative location focused agricultural intelligence company, aWhere, Inc. The aWhere platform delivers location centric data management, analysis, visualization and reporting - integrating on-the-ground observations with contextual, geographic data, analytics, and a globally viable localized observed and forecast agricultural weather system.

RIVKA OFFENBACH (Israel)

Greenhouse Vegetable Specialist | Central and Northern Arava R&D

"Vegetable Cultivation in the desert of Israel – Challenges for the rural communities in the Arava"

Rivka Offenbach is a greenhouse vegetable specialist with over 40 years of global experience, from the Central and Northern Arava Research and Development station in Israel's south. Ms Offenbach holds a Bachelor of Science specialising in agronomy and a Masters of Science in genetics from the Hebrew University of Jerusalem. She has held positions with the prestigious Volcani institute and Israel's Ministry of Agriculture along with a number of Israeli and overseas academic institutions. Ms Offenbach has lectured on growing vegetables to audiences in over 25 countries across the globe. Ms Offenbach lives and works in the Arava region which stretches along the rift valley in the south of Israel. The Arava is extremely hot and arid with an average annual precipitation of 50 mm and potential evaporation above 3,200 mm. The water is saline and in limited supply and most of the land cannot be considered as arable soil. Despite this, the region has intensive agricultural with mostly vegetables being grown for export to premium markets.

BLAIR RICHARDSON (Colorado, USA)

President & CEO | United States Potato Board

Topic: "Uber-ization of the Food Industry"

Mr Richardson was born into a long family history of farming. He graduated from Texas A&M in 1989 and has since spent 24 years in the Californian agricultural industry. Mr Richardson also has extensive experience internationally in sales and marketing ventures, both privately and from an industry association perspective. Since his instatement as CEO of the US Potato Board two years ago, he has been learning about the concerns of the potato industry and potato farmers across the US. He has facilitated strategic planning sessions as part of the Board's new long range planning process.

Mr Richardson has served on numerous industry boards, including the Produce for Better Health Foundation (PBH) Financial Advisory Committee, the PBH Executive Committee, the Produce Marketing Association's Foundation for Industry Talent, the California Minor Crops Council board, the Coordinating Council for the Stewardship Index and others. He is currently the chairman of the Alliance for Potato Research and Education.

ROGER TRIPATHI (Salt Lake City, USA)

Managing Direction – M&S | Cytozyme

Topic: "Sustainable Soil to Shelf Nutritional Solutions – an Integral part of ICM for Stress Management, especially in Australian conditions"

A truly global business leader with 31+ years of distinguished experience in the agriculture industry in business development and sales & marketing fields. Roger, who is an Australian and American Citizen with Indian heritage, has worked in all parts of the world including Asia, Middle East, Australia/NZ and Americas. Currently, Roger is working as Managing Director - M&S for Cytozyme, a global bionutritional company, directing marketing & sales activities and managing total revenue objectives through the global team.

In managing biotic pressure, we sometimes disregard the proactive management of abiotic stresses. Looking at our unpredictable environmental stresses, it is the need of the hour that we look for solutions which optimize the natural processes in plants, aid growth and provide strength to resist/ tolerate external threats of abiotic and biotic pressure. Cytozyme's advanced MAC Trigger Technology harnesses the power of Metabolically Active Compounds (MAC) to enhance plant performance through multi-level modes of actions.

DAVID ROSENBERG (New Jersey, USA)

CEO and Co-Founder | Aerofarms

Topic: "Vertical Farming, Pitfalls and Opportunities"

David, a serial entrepreneur, co-founded and leads AeroFarms, a clean-technology company that builds and operates advanced vertical farms in urban environments. AeroFarms has been recognized as a Circular Economy 100 company and was voted Most Innovative Company at the Future of Agriculture conference. David is also the founder of Hyorete, Inc., a cleantech nanotechnology company. David is an active member of the World Economic Forum (WEF), within which he is honoured as a Young Global Leader. At WEF he is also a Co-Lead for Technology and Innovation Group of The Transformational Leaders in Agriculture and was a Member of the Global Agenda Council on Water Security. Davis is also a member of the B20 SME Taskforce, which advises the G20. David is also a member of Young Presidents Organization. David is an annual lecturer at Columbia Business School and a former adjunct professor at NYU's Stern School of Business. David received his BA from UNC Chapel Hill and holds an MBA from Columbia University. He competed for the U.S. in Fencing where he was a finalist at a world cup and represented the NYAC, helping the club win three U.S. National Fencing Championships.

GLOBAL TECHNOLOGIES IN HORTICULTURE

SEMINAR | GROUP 1

Time	Event	Location
10:30am – 11:00am	**Morning Tea and Welcome**	Marquee Venue
11:00am – 11:10am	**Introduction by Chair, Tom O'Meara**	Marquee Venue
11:10am – 11:30am	**Jan Bontsema** Automated robotic labour for modern greenhouses	
11:30am – 11:50am	**John Corbett** Agile, localized, 'big data' and analytics to address production challenges under increased weather variability	
11:50am – 12:10pm	**Blair Richardson** Uber-ization of the Food Industry	
12:10pm – 12:30pm	**Rivka Offenbach** Vegetable cultivation in the desert of Israel – challenges for the rural communities in the Arava	
12:30pm – 1:10pm	**Panel Q&A**	
1:10pm – 2:00pm	**Lunch**	Marquee Venue
2:00pm – 2:10pm	**Introduction by Tom O'Meara**	Marquee Venue
2:10pm – 2:30pm	**David Rosenberg** Vertical farming: Pitfalls and opportunities	
2:30pm – 2:50pm	**Roger Tripathi** Sustainable soil to shelf nutritional solutions – an integral part of ICM for stress management, especially in Australian conditions	
2:50pm – 3:10pm	**Tara McHugh** New sustainable processing technologies to produce healthy, value-added foods from fruits and vegetables and their co-products	
3:10pm – 3:30pm	**Steinar Henskes** Innovative technology for effective and animal-friendly bird control in horticulture	
3:30pm – 4:10pm	**Panel Q&A**	
4:10pm – 4:20pm	**Conclusion**	
4:20pm – 5:30pm	**Post-Seminar Hospitality**	Marquee Venue

GLOBAL TECHNOLOGIES IN HORTICULTURE

SEMINAR | GROUP 2

Time	Event	Location
10:30am – 11:00am	**Morning Tea and Welcome**	Marquee Venue
11:00am – 11:10am	**Introduction by Chair, Hon. Paul Calvert**	Coolangatta 1, 2, 3
11:10am – 11:30am	**David Rosenberg** Vertical farming: Pitfalls and opportunities	
11:30am – 11:50am	**Roger Tripathi** Sustainable soil to shelf nutritional solutions – an integral part of ICM for stress management, especially in Australian conditions	
11:50am – 12:10pm	**Tara McHugh** New sustainable processing technologies to produce healthy, value-added foods from fruits and vegetables and their co-products	
12:10pm – 12:30pm	**Steinar Henskes** Innovative technology for effective and animal-friendly bird control in horticulture	
12:30pm – 1:10pm	**Panel Q&A**	
1:10pm – 2:00pm	**Lunch**	Marquee Venue
2:00pm – 2:10pm	**Introduction by Chair, Hon. Paul Calvert**	Coolangatta 1, 2, 3
2:10pm – 2:30pm	**Jan Bontsema** Automated robotic labour for modern greenhouses	
2:30pm – 2:50pm	**John Corbett** Agile, localized, 'big data' and analytics to address production challenges under increased weather variability	
2:50pm – 3:10pm	**Blair Richardson** Uber-ization of the Food Industry	
3:10pm – 3:30pm	**Rivka Offenbach** Vegetable cultivation in the desert of Israel – challenges for the rural communities in the Arava	
3:30pm – 4:10pm	**Panel Q&A**	
4:10pm – 4:20pm	**Conclusion**	
4:20pm – 5:30pm	**Post-Seminar Hospitality**	Coolangatta 1, 2, 3

Global Technologies in Horticulture Seminar – 25 June 2015

Speakers:	Dr Jan Bontsema Dr John Corbett Mr Steinar Henskes Dr Tara McHugh Ms Rivka Offenbach Mr David Rosenberg Mr Blair Richardson Mr Roger Tripathi The Hon Paul Calvert (Co-Chair) Mr Tom O'meara (Co-Chair)	**Venue:**	Jupiters Gold Coast, Marquee Venue and Coolangatta Rooms 1,2 and 3.
Apologies:			
Date:	25 June 2015	**Time:**	10.57am – 3:48pm
Meeting objectives:	• *Provide insights on how to improve the effectiveness, efficiency and economic viability of the Australian vegetable industry.* • *Increase knowledge and understanding amongst growers of advancements in global horticultural technology.* • *Open discussion on methods to integrate new technologies into growing operations.*		

The Seminar began at 10:57am.

1.0 Welcome and introduction

The Chair welcomed speakers and guests to the Seminar and noted housekeeping items and etiquette. In particular, the Chair respectfully requested that all presenters stay within the 20 minutes allotted to each of them. The Chair also requested that delegates complete their feedback forms throughout the course of the Seminar.

The Chair introduced the first round of Seminar speakers.

2.0 Dr Jan Bontsema, Senior Scientific Researcher, Wageningen UR, Greenhouse Horticulture, The Netherlands: *Robotic Harvesting of Fruit Vegetables*

Mr Bontsema spoke about the robotic harvesting of cucumbers and sweet pepper. Dr Bontsema noted that there had been thirty years of research into robotic harvesting, however, no commercialisation of technology or widespread adoption has taken place.

Dr Bontsema said that through the integration of robotic harvesters, Europe will be able to maintain its sophisticated greenhouse sector. Rising labour costs were also a motivating factor behind pursuing

robotic harvesters. Dr Bontsema also discussed other benefits of robotic harvesting, such as those that would lead to greater levels of food safety and higher levels of quality due to the robots ability to analyse each fruit and selectively harvest those that met the relevant criteria.

3.0 Dr John Corbett, Co-founder and CEO, aWhere Inc, Colorado, USA: *Agile, localized, 'big data' and analytics to address production challenges under increased weather variability*

Dr Corbett spoke about the use of 'big data' analytics to boost productivity, particularly in relation to weather changes.

Dr Corbett noted that in relation to 'big data', accessibility and scale are equally important. Dr Corbett said that through utilising historical data combined with 10 year forecasts and 1-10 year modelling, it is possible to fill the gap in terms of mid to long term climate modelling.

Dr Corbett demonstrated to the audience how his company is using predictive analysis techniques to help growers pinpoint optimal harvesting windows.

4.0 Blair Richard, CEO & President, United States Potato Board, Colorado, USA: *The 'uber-ization of the food industry*

Mr Richardson spoke about the 'uber-ization' of the vegetable industry. He gave an example of the convergence of people and technology. Millennials and beyond are increasingly being driven by conscience in terms of commerce. He also noted that new generations are more socially dependant, and as such, will ask friends before making decisions and purchases.

Mr Richardson also noted that transparency is absolutely critical, with modern day consumers demanding higher levels of service and honesty. In relation to this, he also noted that consumers are sceptical but faithful while also being adventurous and valuing experiences over 'things'.

Mr Richardson also spoke about how technological devices have changed the world, especially in relation to communication with information delivery being increasingly personalised.

Mr Richardson noted that in the US, delivery services have taken off, including fresh fruit and vegetables.

5.0 Ms Rivka Offenbach, Greenhouse Vegetable Specialist, Northern and Central Arava R&D Centre, Israel: *Vegetable cultivation in the desert of Israel – challenges for the rural communities in the Arava*

Ms Offenbach spoke about growing vegetables in the desert and the innovative approaches taken by her R&D with respect to soil salinity and water management.

Ms Offenbach noted that for over 60 years, nothing was able to be grown due to the harsh conditions of the Arava desert. However, through the use of irrigation technology, production and yields have increased dramatically and the R&D centre now includes protected cropping and field cropping.

6.0 Q&A Session began at 12:36

It was asked if refrigerated mailboxes are taking off in the US.

It was said that the system could work, however, has not been implemented yet. It will, however, take-off given the demand from consumers and the need to build efficiencies into the food supply chain.

It was asked if the Israelis had desalination technology that would be affordable for individual growing operations.

It was said that Israeli growers are purchasing such equipment. However, given the expense and lack of water, the Israeli government will be subsidising growers to develop this technology.

It was asked how satellite data was used to compile climate data.

It was said that satellites were one part of a larger data collection network – only through the collection of large quantities of data can projections be improved.

It was asked if in future a robotic harvester will be fast enough to handle the commercial quantities of vegetables.

It was said that the optimal cycle time for harvesting each piece of fruit is 6 seconds compared to 2 for humans, however, robots can harvest 24 hours a day. A robot with a cycle of 12 seconds would be half as expensive to purchase.

It was said that the researchers are hopeful of achieving these cycle times.

It was asked if any calculations had been done on what the robot would cost.

It was said that the manipulating arm used to be $60,000 and is now $20,000. As such, costs are becoming more affordable. It was said that it is feasible that growers will operate multiple harvesters on each farm in the future. Pay-back time depends on the frequency of harvests.

It was asked if down the track food-sharing would be a prospect, if families only want to use part of a product the remainder could go to another family and will reduce wastage.

It was said that this is happening today on a smaller scale with “buying co-ops” used as an example.

It was asked how increased overnight temperatures were affecting coffee crops and how this was being dealt with.

It was said farming at higher elevations and breeding were being used but with varying degrees of success.

It was asked how reliant the researchers were on government money.

Most speakers said none except for Ms Offenbach, who said that the funding is decreasing.

Mr Bontsema said that he also had government funding through the EU and also grower levy funds.

7.0 Mr David Rosenberg, CEO, AeroFarms, New Jersey, USA: Vertical farming: *Pitfalls and opportunities*

Mr David Rosenberg spoke about AeroFarms’ work regarding vertical farming, also known as aeroponics.

During his presentation, he spoke about the benefits of vertical farming, such as the fact that it uses 95% less water, no pesticides, up to 60% less fertilizer and decreased cultivation times relative to traditional growing methods.

Mr Rosenberg noted that the yield per square metre is approx. 70% greater than traditional growing methods. He also noted that growing using artificial lighting allows for precision growing through the control of light available to plants.

Mr Rosenberg told that audience that given the increasing rate of urbanisation, growing in urban centres will become increasingly important.

8.0 Mr Roger Tripathi, Managing Director, M&S, Cytozyme, Utah, USA: *Sustainable soil to shelf nutritional solutions – An integral part of ICM for stress*

Mr Tripathi spoke about the importance of plant stress management, especially in Australian conditions. Mr Tripathi spoke about sustainable soil to shelf nutrition solutions.

Mr Tripathi noted that Cytozyme reduces the stress caused to plants by traditional chemicals.

9.0 Dr Tara McHugh, Lead Research, Western Division, US Department of Agriculture, California, USA: *New sustainable processing technologies to produce healthy, value-added foods from fruits and vegetables and their co-products*

Dr McHugh spoke about sustainable processing technologies that have been researched by the United States Department of Agriculture.

Dr McHugh noted that in the US, one third to one half of all produce is wasted.

Dr McHugh said that she has worked on forming and casting techniques along with various other value added products such as fruit and vegetable films which can be used to glaze hams. The films can also be used for antimicrobial packaging.

She said that she is now beginning work on nanotechnology using veg waste. Additionally UV and solar processing are also technologies currently being investigated. Dr McHugh also noted that her department has found that exposing carrots to UVB significantly increases antioxidant content.

10.0 Mr Steinar Henskes, CEO and Founder, Bird Control Group, The Netherlands: *Innovative technology for effective and animal-friendly bird control in horticulture*

Mr Henskes spoke about using lasers to deter birds from the fields of farms and airports.

Mr Henskes noted that traditional bird control methods are inefficient in the long-term and are unfriendly to the birds and the environment. Mr Henskes said that lasers solve the conflict between people and birds.

11.0 Q&A session began at 3:26

It was asked what effect the laser would have on animals that share farms with veg i.e. horses.

It was said that cows/horses are not affected and that the laser has been trialled on a dairy farm with no adverse effect to the cows whilst addressing the bird issue.

It was asked if there is a vitamin D effect on produce grown vertically.

It was said that as the light can be controlled, the nutritional profile is as good if not better than conventionally grown vegetables.

It was asked if the roots in aero-farming are in water.

It was said that no, the plant is provided with nutrition via a mist.

It was asked if there were plans to use the laser to target other species such as rabbits and insects.

It was said that on-going research is being done on other species, although it has not been particularly effective on rabbits.

It was asked how economically viable the laser is for smaller operations.

It was said that the cheapest option is 250 euro. The automated version is 5000 euro.

It was asked if a property is located next to an airfield, what regulatory process/hurdles must be overcome.

It was said that because the laser is low energy there are no regulatory hurdles, however, in order to avoid issues it is essential to inform relevant authorities.

It was asked if the ugly fruit and vegetable trend is gaining any traction in the US.

It was said that general education of consumers is essential to minimising waste particularly in fruit and vegetables.

It was asked if the laser could effectively deter birds from entering into sheds and if it would be safe inside.

It was said that this was possible, but more often this was done using a hand held unit or alternatively through the installation of an automated unit high in the shed, aiming it at any areas where birds would sit/nest.

It was asked if aeroponics had investigated producing seed potatoes.

It was said that given the expense involved the business has had to maintain a specific focus and at this stage that focus has remained on leafy veg.

It was said that the aeroponic germination process is 12-48 hours compared to 8-10 days and as such this may have application in the seed potato industry.

Chair thanked the speakers for their time and presentations.

It was asked if the lasers could be used for non-flying birds.

It was said that the technology has only really been tested on flying birds that are most prevalent in Europe.

It was asked about AeroFarms' concerns for feeding the world and if the technology has been used to adapt vertical farming to vegetables other than leafy greens to more substantial products.

It was said that there will be a future focus on other crops and that the company acknowledges that the world could not be fed on leafy greens alone. It was said the technology could also be used for herbs and microgreens.

It was asked if there is a difference in shelf life between vertically farmed and conventionally grown products.

It was said that individual products and varieties can be adapted with different shelf lives and that this can be targeted for individual markets. It was said that the optimum shelf life depends on the target market.

It was asked if UV can be used to reduce the use of chemicals and disinfectants in food products.

It was said that there are particular spectrums of UV and that UVC could potentially be used to do this.

It was asked if carrot wraps and vegetable films could be used as edible packaging. It was said that this is possible and that films have been tried as sandwich wraps. It was said that cost is problematic and food wraps cost a lot more than synthetic packaging.

It was asked if Cytozyme foresees any potential registration problems with their products.

It was said that this isn't expected, and that quarantine is the biggest concern but will be addressed.

The meeting concluded at 3:48

Appendix 4 – Feedback Form

Mr Blair Richardson: *"Uber-ization of the food industry"*

How engaging did you find Mr Richardson's presentation?

Not engaging ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Very engaging**

How relevant was Mr Richardson's address to your business or operation?

Not relevant ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Very relevant**

Ms Rivka Offenbach: *"Vegetable cultivation in the desert of Israel – challenges for the rural communities in the Arava"*

How engaging did you find Ms Offenbach's presentation?

Not engaging ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Very engaging**

How relevant was Ms Offenbach's address to your business or operation?

Not relevant ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Very relevant**

Mr David Rosenberg: *"Vertical farming: Pitfalls and opportunities"*

How engaging did you find Mr Rosenberg's presentation?

Not engaging ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Very engaging**

How relevant was Mr Rosenberg's address to your business or operation?

Not relevant ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Very relevant**

Mr Roger Tripathi: *"Sustainable soil to shelf nutritional solutions – an integral part of ICM for stress management, especially in Australian conditions"*

How engaging did you find Mr Tripathi's presentation?

Not engaging ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Very engaging**

How relevant was Mr Tripathi's address to your business or operation?

Not relevant ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Very relevant**

Dr Tara McHugh: *"New sustainable processing technologies to produce healthy, value-added foods from fruits and vegetables and their co-products"*

How engaging did you find Dr McHugh's presentation?

Not engaging ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Very engaging**

How relevant was Dr McHugh's address to your business or operation?

Not relevant ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Very relevant**

Mr Steinar Henskes: *"Innovative technology for effective and animal-friendly bird control in horticulture"*

How engaging did you find Mr Henskes' presentation?

Not engaging ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Very engaging**

How relevant was Mr Henskes' address to your business or operation?

Not relevant ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Very relevant**

How worthwhile did you find the 2015 Global Technologies in Horticulture Seminar?

☐Not worthwhile ☐Slightly worthwhile ☐Worthwhile ☐Very Worthwhile

Would you consider attending another Global Technologies in Horticulture Seminar or similar event again?

☐ Yes ☐ No

How did you hear about the 2015 Global Technologies in Horticulture Seminar?

☐ AUSVEG Weekly Update ☐ Vegetables Australia Magazine ☐ AUSVEG representative ☐ Word of mouth

☐ Other (please specify) _____

Was there something you liked or something we could improve for next time?

Additional Feedback

Thank you for taking the time to complete this survey. Your responses will be used to guide and improve future seminars.

If you have any further questions or comments about the 2015 Global Technologies in Horticulture Seminar, please contact Stefan Oberman via email at stefan.oberman@ausveg.com.au or by phone on (03) 9882 0277 or 0425 782 968.

Appendix 5 – Selected Media Clippings

Briscoe plays a pre-recorded interview with Blair Richardson...

ABC Northern Tasmania, Launceston hosted by **Tony Briscoe**
Tasmanian Country Hour - 4 mins 40 secs - ID: W00062229515

25 Jun 2015 12:43 PM

Briscoe plays a pre-recorded interview with Blair Richardson, the President and CEO of the US Potato Board, regarding the **AUSVEG** Convention on the Gold Coast. Richardson details his idea for revolutionising how farmers transport their food, via ridesharing iPhone technology. Briscoe draws comparisons to the Uber app. US Department of Agriculture Research Leader Dr Tara McHugh details the development of platform technologies which can be use to produce a wide variety of fruits and vegetables, citing vacuum-forming and casting technology as examples. She details the benefits of value-adding for limiting or reducing food waste.

Order presentation file or transcript

Keywords
AUSVEG (1)

Interviewees
Blair Richardson, President and CEO, US Potato Board
Dr Tara McHugh, Research Leader, US Department of Agriculture

Also broadcast from the following 1 station

N/A ALL
N/A MALE 16+
N/A FEMALE 16+

Veggie grower seminar will inspire with lasers, robots

Farming Ahead, National 01 Jun 2015
General News - page 12 - 368 words
Photo: Yes - Type: News Item - Size: 358 cm² - ID: 422354959

VEGETABLE growers will be transported into the future, with laser beams, robots and mid-air vegetable cultivation taking centre stage at Australia's 2015 Global Technologies in Horticulture Seminar to be held on June 25 in the Gold Coast. The seminar aims to educate Australian growers on the futuristic technology they can employ on-farm.

Read full text - Download print article

Keywords
vegetables (1), ausveg (1), industry (3), Stefan Oberman (1), vegetable (2), VEGETABLE (1), AUSVEG (5), Australian vegetable (2), growers (8)

10,000 CIRCULATION

Technology exhibition

Ballarat Courier, Ballarat VIC 27 May 2015
General News - page 16 - 115 words
Photo: No - Type: News Item - Size: 49 cm² - ID: 412563402

LASER beams, robots and mid-air vegetable cultivation will be on the agenda for more than 100 of the country's leading vegetable growers at the 2015 Global Technologies in Horticulture Seminar to be held on June 25 at Jupiters Gold Coast. The AUSVEG seminar aims to educate Australian growers on the futuristic technology they can employ on-farm to help with the development of the Australian vegetable industry and ensure it remains at the pinnacle of global vegetable production.

Read full text - Download print article

Keywords
Australian vegetable (1), AUSVEG (1), industry (1)

15,110 CIRCULATION

Marty McCarthy report. Varischetti mentions that this year's...

ABC South West WA, Bunbury hosted by **Belinda Varischetti**
WA Country Hour - 4 mins 27 secs - ID: V00062231038

25 Jun 2015 12:29 PM

Marty McCarthy report. Varischetti mentions that this year's **AUSVEG** Convention on the Gold Coast is about global technologies in horticulture. Blair Richardson, president and CEO, US Potato Board, details his idea for revolutionising how farmers could transport their food through ridesharing iPhone technology which is similar to Uber. He mentions that smartphones are the future of the buying and selling produce because they can be used wherever and whenever people want to use them. Dr Tara McHugh, research leaders, US Department of Agriculture, details the development of platform technologies which can be use to add value and produce a wide variety of fruits and vegetables, citing vacuum-forming and casting technology as examples. She details the benefits of value-adding for limiting or reducing food waste.

Order presentation file or transcript

Keywords
AUSVEG (1)

Interviewees
Blair Richardson, president and CEO, US Potato Board
Dr Tara McHugh, research leaders, US Department of Agriculture

N/A ALL
N/A MALE 16+
N/A FEMALE 16+

Also broadcast from the following 7 stations

Marty McCarthy Interview with Blair Richardson, President an...

ABC Central Victoria, Bendigo hosted by Ed Cowlishaw 30 Jun 2015 6:38 AM
Breakfast - 4 mins 44 secs - ID: V00062276093

Marty McCarthy Interview with Blair Richardson, President and CEO, US Potato Board, and Dr Tara McHugh, research leader, US Department of Agriculture, on their contribution to the ongoing horticulture industry convention on the Gold Coast. Cowlishaw says the theme of the AUSVEG Convention is Global Technologies in Horticulture. He says an app similar to Uber now exists for people who ever get stuck with crates full of produce that they just cannot arrange and Richardson talks about this idea of his that could revolutionalise how farmers transport their food.. Richardson explains that people can use this new technology through an iPhone or other personal device and take control of the transportation, delivery, information, and ratings of a product. McHugh talks about farming smarter and says the key to doing so is by getting more value out of what is already being grown. McHugh shares that they work on new platform technologies that can add value to a wide range of mushrooms, crops, nuts, fruits and vegetables, such as vacuum forming technology and casting technology. She says that value-adding also offers better opportunities to better utilise waste materials and reduce food waste.

Order presentation file or transcript

Keywords

AUSVEG (1)

Interviewees

Blair Richardson, President and CEO, US Potato Board

Dr Tara McHugh, research leader, US Department of Agriculture

Marty McCarthy, rural reporter, ABC Rural

N/A ALL
N/A MALE 16+
N/A FEMALE 16+

Also broadcast from the following 1 station

Zonca talks about aeroponics, a method of growing plants in ...

ABC Southern Queensland, Toowoomba hosted by **Craig Zonca** 25 Jun 2015 12:22 PM

Qld Country Hour - 10 mins 55 secs - ID: V00062229319

Zonca talks about aeroponics, a method of growing plants in air. He says it is being discussed at the **National** Horticulture **Convention**. Marty McCarthy, ABC, says issues affecting the horticulture industry are going to be discussed in the event such as the supermarket code of conduct, labour workforce laws, and free-trade agreements. He adds that social issues affecting regional communities such as the use of ice are going to be discussed. He says the best of Australian produce is going to be displayed tomorrow for international trade delegates to see. According to him, technology and innovation within the horticulture is going to be discussed today. Jodie Gunders, ABC, talks about some of the innovations they are hearing about such as automated robotic labour for greenhouses, and using big data to stay ahead of the weather. David Rosenberg, CEO, AeroFarms, talks about vertical farming. He also talks about the advantages of it. He says one of its important features is the production can be close to where it is used. Gunders talks about how smartphones can play a role in farmers transporting their produce. McCarthy says there is now an app for it. He says some vegetable experts are at the **AUSVEG Convention** on the Gold Coast to encourage farmers and industry to do things different. Blair Richardson, President, United States Potato Board, says future land farmers can use apps for their phones similar to Uber to arrange cheap and efficient transport for their produce. He talks about its benefits for farmers. He says the workshops today are all about farming smarter and Tara McHugh, Research Leader, US Department of Agriculture, says the key to achieving it is getting more value at what they already grow. She says they work on new technologies that can add value to fruits and vegetables. She adds that they develop technologies to utilise materials to reduce food waste.

Order presentation file or transcript

Keywords

National (1), AUSVEG (1), Convention (2)

Interviewees

David Rosenberg, CEO, AeroFarms

Blair Richardson, President, United States Potato Board

Tara McHugh, Research Leader, US Department of Agriculture

3,200 ALL
1,000 MALE 16+
2,200 FEMALE 16+

Interview with Stefan Oberman, spokesman, AUSVEG, to talk ab...

3WM, Horsham hosted by **Nick O'Connell** 27 May 2015 12:27 PM
Country Today - 4 mins 22 secs - ID: V00061871740

Interview with **Stefan Oberman**, spokesman, **AUSVEG**, to talk about the **2015** Global Technologies **conference** which will be held at the Jupiter's Casino on the 25th of June. Oberman says leading R and D specialists from around the world will talk to **vegetable growers** in Australia in the hope that they will become more efficient, more sustainable and more profitable. He says the majority of high-tech technology that they will be showing is already available commercially in the marketplace. He says they have a good radio technology such as laser devices that deal with pest management of birds. He mentions there will also be an R and D **vegetable** specialist from Israel who will talk about **growing vegetables** in the desert. He says Dr. John Corbett, aWhere, will talk about localised weather forecasting. He says Tara McHugh, US Department of **Agriculture**, will talk about what farmers can do to **vegetables** that cannot be sold to retailers. He says aeroponics will also be discussed in the **conference**. He says that around the time of the seminar, they will also have the **National Horticulture Convention**.

Order presentation file or transcript

Keywords

Horticulture (1), vegetables (2), Stefan Oberman (1), conference (2), Convention (1), growing (1), AUSVEG (1), National (1), vegetable (2), 2015 (1), Agriculture (1), growers (1)

N/A ALL
N/A MALE 16+
N/A FEMALE 16+

Interviewees

Stefan Oberman, spokesman, AUSVEG

Bryant says some of the world's brightest vegetable experts ...

ABC Central West NSW, Orange hosted by Sally Bryant — 29 Jun 2015 6:45 AM
Rural Report - 4 mins 47 secs - ID: V00062271472

Bryant says some of the world's brightest vegetable experts are attending the **AusVeg** convention on the Gold Coast, where the theme is global technologies in horticulture. In an audio, Blair Richardson, CEO, US Potato Board, talks about his participation in the event and his idea on how farmers can revolutionise their food. He says they're looking at new iPhone technology, similar to Uber to allow farmers to take control of transportation and delivery of produce, and explains how it could benefit farmers. He mentions that smartphones are the future of the buying and selling produce because they can be used wherever and whenever people want to use them. In an audio, Dr Tara McHugh, research leaders, US Department of Agriculture, details the development of platform technologies which can be used to add value and produce a wide variety of fruits and vegetables, citing vacuum-forming and casting technology as examples. She details the benefits of value-adding for limiting or reducing food waste.

Order presentation file or transcript

Keywords
AusVeg (1)

N/A ALL
N/A MALE 16+
N/A FEMALE 16+

Interviewees
Blair Richardson, CEO, US Potato Board [excerpt]
Dr Tara McHugh, research leaders, US Department of Agriculture [excerpt]

Also broadcast from the following 3 stations

The way of the future for growing vegies

Daily Examiner (Grafton), Grafton NSW — 15 Jun 2015
General News - page 13 - 185 words
Photo: No - Type: News Item - Size: 87 cm² - ID: 420638634

LASER beams, robots and midair vegetable cultivation will be on the agenda for more than 100 of the country's leading vegetable growers at the 2015 Global Technologies in Horticulture Seminar to be held on Thursday June 25 at Jupiters Casino on the Gold Coast. The Seminar aims to educate Australian growers on the futuristic technology they can employ on-farm, and builds on a highly successful series of annual seminars facilitated by **AUSVEG** to help with the development of the **Australian vegetable industry** and ensure it remains at the pinnacle of global vegetable production.

Read full text - Download print article

Keywords
Australian vegetable (1), AUSVEG (2), ausveg (1), industry (1)

4,098 CIRCULATION

Report by Marty McCarthy at the National Horticulture Conven...

ABC North Queensland, Townsville hosted by Charlie McKillop
29 Jun 2015 6:22 AM
Rural Report - 3 mins 05 secs - ID: V00062262300

Report by Marty McCarthy at the National Horticulture Convention on the Gold Coast. Pre-recorded interview with Steinar Henskes, Founder, Bird Control Group. McKillop says there are a few Australian growers are using laserbeam devices to keep birds away from their crops but adds that Henskes, Dutch inventor of the product, wants to see if it will work on bats as well. Henskes says light devices are an eco-friendly way of controlling birds and may also be effective against bats that damage crops. Henskes also says the lasers are much more effective during nighttime. Henskes then says it is a sustainable solution and animal and environmentally friendly as well.

Order presentation file or transcript

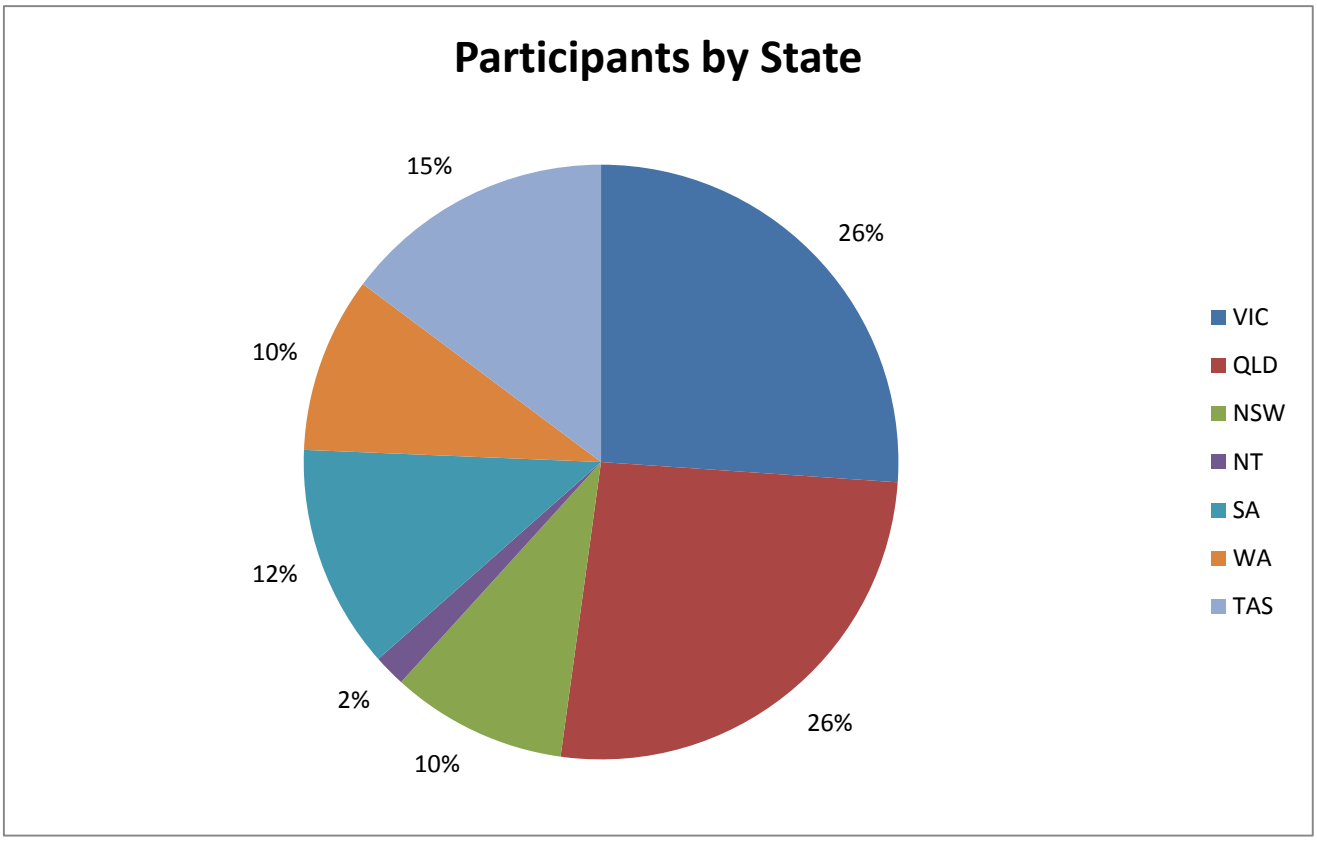
Keywords
National Horticulture (1), Convention (1)

Interviewees
Steinar Henskes, Founder, Bird Control Group

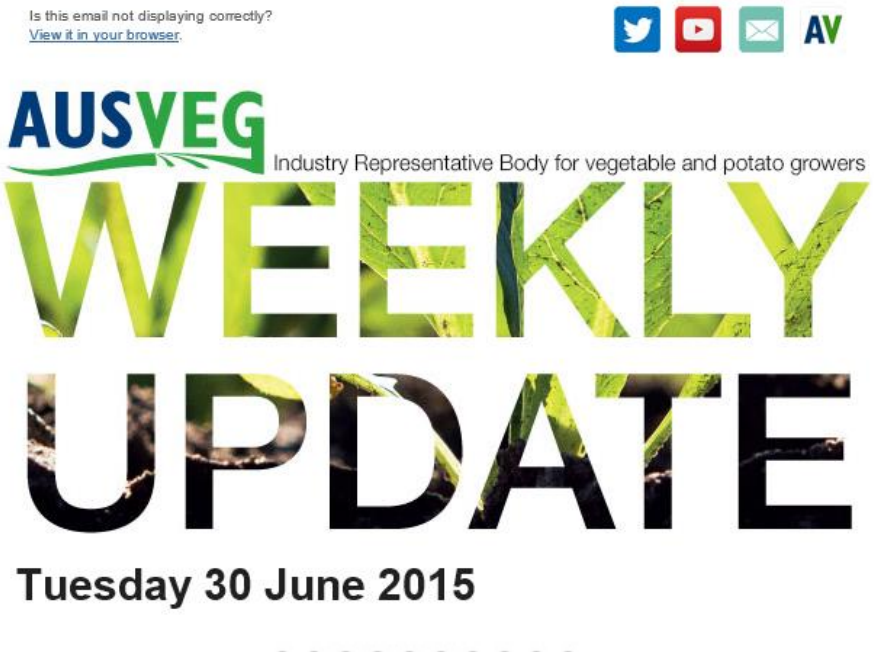
Also broadcast from the following 1 station

N/A ALL
N/A MALE 16+
N/A FEMALE 16+

Appendix 6 – Demographics of Attendees



Appendix 7 – Post-seminar Dissemination of Content



Is this email not displaying correctly?
View it in your browser.

AUSVEG
Industry Representative Body for vegetable and potato growers

WEEKLY UPDATE

Tuesday 30 June 2015

Aussie growers shown innovative technologies in Global Technologies in Horticulture Seminar

The 2015 Global Technologies in Horticulture Seminar was held on Thursday 25 June at Jupiters Gold Coast, with attendees receiving updates on the latest innovations in global horticulture.

Speakers at the seminar included Co-Founder and CEO of AeroFarms David Rosenberg, robotics specialist Dr Jan Bontsema, Rivka Offenbach and Steinar Henskes. The speakers touched on a number of innovative topics, such as aeroponics (growing vegetables in mid-air), greenhouse production in the Israeli desert and using lasers as bird control.

Videos and presentations will be made available in the coming weeks.

The 2015 Global Technologies in Horticulture Seminar was funded by Horticulture Innovation Australia using the National Vegetable Levy and funds from the Australian Government.

Appendix 8 - Seminar Flyer

THURSDAY 25 JUNE

10:45AM – 5:30PM

JUPITERS GOLD COAST

VEGETABLE LEVY PAYERS CAN APPLY TO AUSVEG TO HAVE RETURN FLIGHTS TO THE GOLD COAST, TWO NIGHTS' OF ACCOMMODATION AT JUPITERS AND MEAL EXPENSES COVERED WHEN ATTENDING THIS EVENT.

CONTACT: INFO@AUSVEG.COM.AU OR 03 9882 0277

AUSVEG

This event is restricted to vegetable levy payers only.
This project has been funded by HIA using the vegetable industry levy and matched funds from the Australian Government.

Horticulture Innovation Australia

Appendix 9 – Seminar Photographs

Image 12: Grower Jim Trandos asks a question during the Q&A session.

Image 13: Growers look on at the 2015 Global Technologies in Horticulture Seminar.

Image 14: David Rosenberg from Aerofarms presents on vertical farming.

Image 15: Rivka Offenbach from the Central and Northern Arava R&D Centre in Israel discussed vegetable growing in the desert.

Image 16: Blair Richardson, President & CEO of the US potato board discusses the 'uber-isation' of the vegetable industry.