Horticulture Innovation Australia

Final Report

Women's Grower Study Tour 2014-2016

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AUSVEG Ltd

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2015 Women in Horticulture Industry Leadership and Development Mission

The Netherlands, Belgium, Switzerland and Germany
31 October – 14 November 2015

Milestone completion date: 30 December 2015

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AUSVEG

Horticulture Innovation Australia

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Purpose:

The purpose of this report is to detail the findings resulting from the 2015 Women in Horticulture Industry Leadership and Development Mission to Europe (VG13706).

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The 2015 Women in Horticulture Industry Leadership and Development Mission was funded by Horticulture Innovation Australia Limited (HIA) using the National Vegetable Levy, voluntary contributions from vegetable growing operations and funds from the Australian Government.

Date: 30 December 2015

Contents

1.0 Media summary

The 2015 Women in Horticulture Industry Leadership and Development Mission provided an opportunity for eight leading female vegetable levy payers to visit innovative vegetable growing operations, processors, research facilities, the world-famous Agritechnica trade show and other industry representatives in the Netherlands, Belgium, Switzerland and Germany. The two-week mission was funded by Horticulture Innovation Australia Limited (HIA) using the National Vegetable Levy, voluntary contributions from vegetable growing operations and funds from the Australian Government.

The key objective of the mission was to provide an opportunity for leading women in the Australian vegetable industry to gain a unique insight into new farming methods, equipment, technologies and strategies currently being used in European horticulture. As emerging leaders in their own right, the participants had ample opportunities throughout the mission to learn from their European counterparts as well as each other, and identify areas of improvement for their own farms.

Importantly, the mission also recognised the pivotal role that women play in the Australian vegetable industry and allowed participants to develop networks and discuss mutual areas of interest. The group consisted of a diverse range of participants representing five Australian states and they each held a different role within their respective businesses, from co-owners and business support roles to on-farm responsibilities in production and agronomy. This allowed participants to share and discuss their diverse range of knowledge and experience and ultimately learn from each other.

The group also met and networked with many influential women in the European horticulture industry throughout the mission and were able to forge key contacts during the two-week mission. Providing networking opportunities for women in horticulture and fostering their skills and experience is a key priority for the Australian vegetable industry and an area where knowledge provision can have considerable on-farm profitability.

During the mission, participants were introduced to new production, technical, research and supply chain systems throughout Europe and learnt of novel innovations relating to both on-farm productivity and consumer demand. Participants also witnessed first-hand an impressive range of greenhouses, as many of the countries visited are widely recognised for setting many benchmarks in protected cropping.

The mission was held from 31 October to 14 November 2015 and began in the Netherlands, where the group visited leading companies, including Bird Control Group, Koppert Cress, Food Centre Amsterdam, Syngenta Seeds, Proeftuin Zwaagdijk, Barendse DC, Pater Broersen, as well as Hoogendoorn Growth Management and its partner companies. Given the timing of the mission, most vegetable growing operations had reached the end of the growing season, but the visits allowed participants to network and discuss mutual areas of concern with the growers to gain a detailed insight into how their businesses operate.

From the Netherlands the group travelled to Belgium where they visited vegetable processor Hesbaye Frost. Participants were given a behind-the-scenes tour of the custom-built factory and learnt of the innovative ways the processor has developed into an industry leader in the frozen vegetable sector.

In Switzerland, the group had the chance to visit Syngenta's Crop Protection Research Biology Centre in Stein and tour its Insect and Disease Control Centre, which gave them a new appreciation of the extensive time, knowledge and effort that is necessary to develop a product for the market.

Finally, participants travelled to Germany for the Agritechnica trade show, where they spent the day discovering the new machinery and technologies available. The group also visited seedling nursery Rudolf Sinn GmbH, before a final visit to the John Deere European Headquarters and tractor factory in Mannheim.

Written evaluations were undertaken by participants to provide a record of each day's events and ensure information was retained, while debriefing sessions were held each evening to discuss key points of interest.

Participants were also encouraged to communicate with local growers in their regions following their return home to disseminate the knowledge and key insights discovered from the mission to the wider Australian vegetable growing community. A feature article on the mission will also appear in an upcoming edition of *Vegetables Australia*, the most widely distributed magazine in Australian horticulture.

2.0 Expected outcomes and how they were achieved

The primary objective of the 2015 Women in Horticulture Industry Leadership and Development Mission was to provide eight female Australian vegetable growers with exposure to the latest in international vegetable production practices and technologies employed by their international counterparts. Essentially, the mission aimed to inspire participants to investigate improvements in their current vegetable growing operations, while simultaneously identifying new ideas and technologies for implementation in Australia.

Additionally, this mission served to promote the role that women play within the Australian and global horticulture industry and provide growers with the opportunity to expand their local and international business networks. Participants on the 2015 mission were given the opportunity to network with their European counterparts and various specialists in protected cropping, processing, research and development, agronomy, machinery, innovation and value-adding to gain a stronger understanding of how the vegetable industry is progressing and how consumer demand is being acknowledged and met.

Knowledge was obtained by visiting a range of vegetable growing operations and research facilities across the Netherlands and Switzerland, a vegetable processor in Belgium as well as the Agritechnica trade show and John Deere European Headquarters in Germany. The diverse range of meetings held during the mission provided insights into new and unique business practices that could be implemented in Australia, and inspired many participants to further research these opportunities upon their return. There is also an expectation that the participants will share their acquired knowledge of European vegetable production processes and developments with their colleagues in the Australian industry.

Participants were asked to share their highlights and key information gained from the meetings at the end of each day and were also required to take written notes in the mission booklet regarding the meetings held.

At the end of the mission, participants completed an evaluation form, which reflected their experiences and the value they received from taking part in the mission. The below quotes provide an overview of the feedback received and have been extracted from the evaluation forms.

- “Excellent choice on visiting Bird Control Group. Fascinating technology that appears to be very relevant to Australian vegetable growers. Good to see it in action.”
- “Koppert Cress is an extremely innovative company, taking measures to stay one step ahead of customer demands. Loved the whole experience of the place.”
- “I found the Food Centre interesting with all the different fruits and veg. Some I had never seen.”
- “The Syngenta Seed centre was excellent, I really enjoyed listing to the R&D work being conducted on Clubroot.”
- “I was amazed at Barendse DC and the passion our hostess had while showing us around … The scale of these operations was beyond imagination.”
- “Wonderful that (Hoogendoorn Growth Management and its partner companies) all had women to meet us. Interesting to hear about all the different companies … All shows what advantages there are to using greenhouses.”
- “I found (Hesbaye Frost) to be a great visit. So much to see and take in from vegetable processing to biogas to environmentally saving wetlands. It was good to see large-scale companies caring about environmental issues.”

- “Companies such as Syngenta are an important link in our farming systems. It was good to go behind the scenes to see exactly how much time and resources are pumped into the development and testing of chemicals.”
- “I went to Agritechnica with an agenda and pre-arranged a meeting and things to see. It was a great opportunity for me … I made some great contacts and learnt a lot.”
- “It was great to see greenhouse production (at Rudolf Sinn GmbH) through all of its processes, from seeding to germination, right up to planting stage.”
- “John Deere gave a thorough and impressive tour of their factory. It was very detailed and the history of the company and John Deere in Mannheim is extremely interesting. A great day.”
- “Every visit had some new learnings for me.”
- “This is a great experience for any female grower to broaden their network and learn what other businesses are doing across the globe.”
- “Well organised and great people. The tour opened my eyes to new and innovative ways of thinking and allowed myself to experience the various adaptations made by vegetable growers on a global scale.”
- “I have met some amazing women and only extended my knowledge through listing to their experiences. I will recommend the tour every chance I get.”
- “This has been the trip of a lifetime for me. I have enjoyed every moment.”

3.0 Mission report

Day 1: Saturday 31 October

Australia – Netherlands: Travel day

Participants met in Melbourne and travelled as a group to Amsterdam in the Netherlands.

Day 2: Sunday 1 November

Australia – Netherlands: Travel and rest day

After arriving in Amsterdam, participants attended a short industry networking canal cruise and welcome dinner.

Day 3: Monday 2 November

Netherlands: Bird Control Group and Koppert Cress

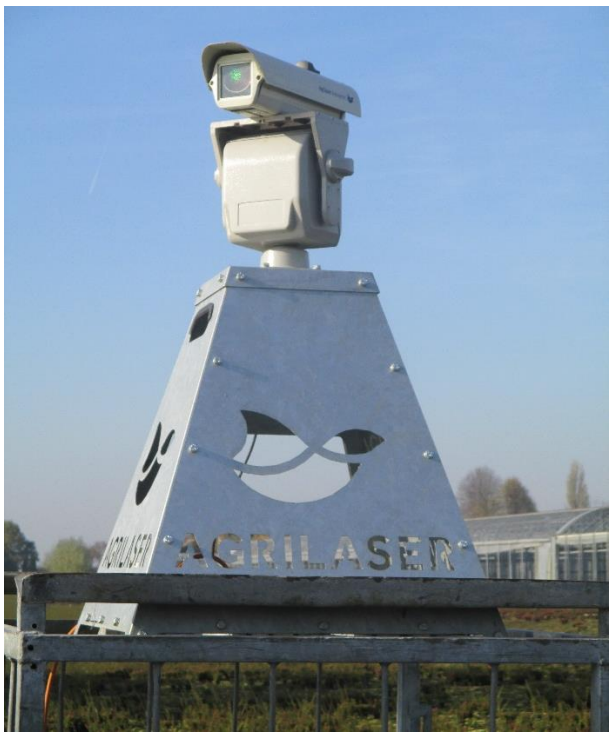
To kick off the 2015 Women in Horticulture Industry Leadership and Development Mission, participants travelled to Delft to visit Bird Control Group, which develops animal-friendly laser technology for a range of industries, including agriculture, to keep birds at a safe distance. This innovative company is part of "Yes!Delft", a European organisation that houses start-up companies for five years to promote entrepreneurship and accelerate their businesses.

Participants met with Bird Control Group Agrilaser Sales Director Corné Sweep and Sales Support Specialist Ali Ahmed, who explained how the company has grown considerably since its inception in 2012. Bird Control Group now services approximately 80 countries in a range of industries including aviation, fisheries, renewable energy and agriculture.

Its flagship product, the Agrilaser Autonomic, is a fully automated laser beam system that can continually repel birds in a safe manner. The birds perceive the laser beam as an approaching car, causing them to fly away. Over time, the continuous presence of the moving laser beam keeps the area free from birds, as they consider it to be unsafe. The laser beam itself has a range of up to 2.5 kilometres.

While the Agrilaser Autonomic is a standalone, portable system, smaller handheld automatic laser products are also available. The system is easy to set up, as it can be connected to a laptop and equipped with an additional solar charging system. Importantly, research has shown that the laser also maintains eye safety for both humans and birds.

Following the presentation, the group visited the open greenhouse of Marcel Mathot in Reeuwijk, where they witnessed a live demonstration of the Agrilaser Autonomic. The participants saw great potential for the product to be used on their farms, as it is an environmentally-friendly solution to an issue that affects many vegetable growers throughout Australia and results in significant crop damage.



The Agrilaser Autonomic in action at Marcel Mathot's open greenhouse in Reeuwijk.

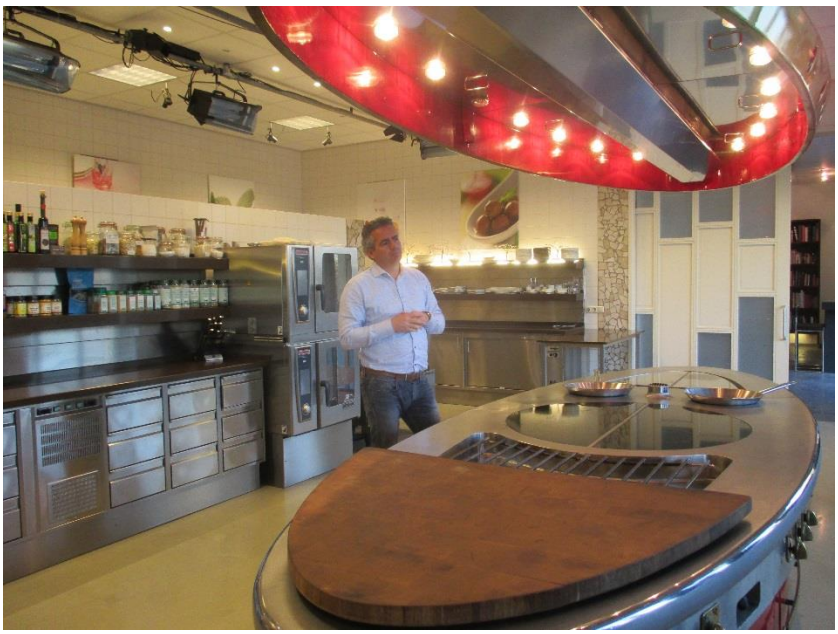
After a short break in Delft, the group stopped by Koppert Cress based in Monster. This company was a popular addition to grower missions in the past and it didn't take long to understand why.

Koppert Cress specialises in growing cresses, or the seedlings of unique plants, which each have their own specific effect on the senses. Participants enjoyed the opportunity to taste test a sample of micro-vegetables from the Architecture Aromatique collection, which expands by at least one new item per year. Some of the samples included cresses and specialities that tasted like cucumber, cumin, oysters and French cheese.

Koppert Cress European Marketing and Communications Manager Bart Leemans explained the company's belief that cresses and specialties are a serious ingredient rather than a simple 'garnish', as good food is crucial to a healthy experience. Interestingly, Koppert Cress only grows the amount of product needed for the market, rather than selling excess stock for a lower return. That said, Bart did admit that this is an easier business approach if you are the only supplier of your kind in the market.

Bart added that the company works directly with end users such as chefs, restaurants, caterers, hotels and food services, as they are responsible for creating a certain dish. This initiative also led to the development of the Cressperience demonstration kitchen at the Koppert Cress Headquarters, where chefs are introduced to the products and can experiment with them in the fully equipped kitchen. The group also toured the company's greenhouses, which were expanded to 1.7 hectares in 2006 to cater for the considerable growth and interest from consumers in the last few years.

This visit was well-received by participants, who were inspired by the company's innovation to develop a unique value-added product in response to consumer demands.



Koppert Cress European Marketing and Communications Manager Bart Leemans shows off the Cressperience demonstration kitchen for chefs to test the company's products.

Day 4: Tuesday 3 November

Netherlands: Food Centre Amsterdam and Syngenta Seeds

Today participants had the chance to witness the inner workings of Food Centre Amsterdam, the wholesale market for the Amsterdam region. The market offers a large and versatile range of fresh produce including fruit and vegetables, meat, game and poultry, fish and packaged food.

The group enjoyed a tour through the different grower stalls and examined much of the produce on display, which hailed from both the Netherlands and abroad. In many cases, participants came across unique vegetable products they had never seen before, such as Romanesco broccoli (pictured below).

Romanesco broccoli at Food Centre Amsterdam.

Participants noted the variety of food products that were available at the wholesale market and highlighted that Australia's quality and freshness appeared to be of a superior standard. Many

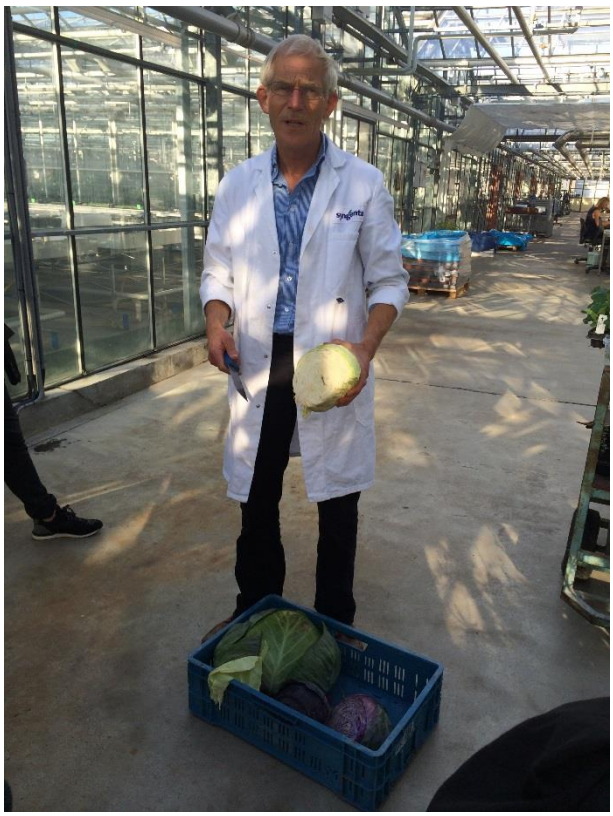
participants were surprised to see one wholesale market house so many different aspects of fresh produce, particularly as an abattoir was located in close proximity to the fruit and vegetable section of the market.

Participants examining the fresh vegetables on display at Food Centre Amsterdam.

Later in the day, the group travelled to Enkhuizen, the home of Syngenta Seeds. During the visit, participants were given an overview of the company's development, production and marketing of vegetable seeds, flower seeds, cuttings and young plants, as well as the strategies implemented to breed out different disease issues.

Participants were fortunate to visit one of the greenhouses to meet with cauliflower breeder Joep Boon, who discussed the breeding program's success with Clubroot. As this is an issue plaguing many participants on their farms, the progress achieved in this area was exciting to hear and had great potential. Joep also demonstrated the success of developing a new variety of cabbage that is a cross between red and white, and doesn't 'bleed' when you cut a red cabbage followed by a white cabbage without wiping the knife.

Joep explained that it can take up to 15 years to introduce a new variety, which reinforced the importance of the amount of research and development conducted by companies such as Syngenta Seeds.



Syngenta Seeds cauliflower breeder Joep Boon demonstrates the new variety of cabbage that doesn't 'bleed' when you cut a red cabbage followed by a white cabbage without wiping the knife.

The tour continued with Seed Health Leader Marjan Vlam, who provided more information about Syngenta's seed health activities in brassicas and cucurbits. Participants had the opportunity to don protective outfits and see the technologies used in the lab and the processes implemented to develop quality seed. Marjan explained that approximately 10,000 seed batch tests are conducted per year at the facility, as there are several ways to validate if seed is healthy. Quality control is also in place as multiple people within the lab are required to validate results before the next step takes place.

Participants agreed that this behind-the-scenes look at Syngenta's research program gave them a new appreciation for the company's extensive product development process.

Participants at the Syngenta Seed Health Lab in Enkhuizen.

Day 5: Wednesday 4 November

Netherlands: Proeftuin Zwaagdijk, Barendse DC and Pater Broersen

The meetings held today were based in the northern area of the Netherlands, where the importance of greenhouse production is evident as you drive through the area. The first stop was Proeftuin Zwaagdijk, one of the leading agricultural research centres in the Netherlands. This company conducts private research for a wide range of clients, including manufacturers of crop protection products and fertilisers, growers, seed companies, suppliers and government, as well as providing training, advice and organising field days. Participants met with Proeftuin Zwaagdijk Project Leader Ronald Hand, who said that the company conducts approximately 700 trials per year.

Following a presentation, participants toured the research facilities and were particularly interested in the current research being developed in different growing techniques, such as cultivation on water. Proeftuin Zwaagdijk has been closely involved in the wholesale creation of a production system of lettuce in water, which involves six separated ponds that circulate water on an ongoing basis.

The production of lettuce in water at Proeftuin Zwaagdijk.

Barendse DC was next on the itinerary, located in the dedicated greenhouse area of Agriport A7. This visit proved to be a highlight of the 2015 Women in Horticulture Mission, as our energetic tour guide and co-founder/owner Petra Barendse showed the group through the extensive facility, which grows orange and green capsicums. While orange capsicums are not common in Australia, Petra explained that they are very popular in the Netherlands as orange is the country's national colour. As a result, Barendse DC can claim the title of the world's largest greenhouse with orange capsicums.

At the time of the visit, the greenhouses were being cleaned and prepared for the next growing season, but a walk through the facility gave the group a clear appreciation of the extensive size of the business. Participants saw the latest greenhouse being built (approximately 10 hectares) and Petra pointed out the added potential to expand yet another 10 hectares.

As energy is a very important factor in greenhouse production, Barendse DC has implemented a sustainable method of producing its capsicums. The company uses geothermal energy and cogeneration systems, which consume natural gas to produce heat, carbon dioxide and electricity.

The heat is stored during summer and ultimately used to heat the greenhouses in winter, while the carbon dioxide is purified and later used in the greenhouse as fertiliser. In addition, any excess electricity is fed back into the grid. Petra explained how this process results in highly efficient plants with up to 95 per cent yield.

Rainwater is also captured and mixed with fertiliser to irrigate the crops. Interestingly, a range of beneficial insects, pheromone traps, parasitic wasps and spiders are used in the biological control of the crops.

One of the vast greenhouses with orange capsicums at Barendse DC.

Given the extensive size of the greenhouses, it was no surprise to see that a high level of automation has been implemented in different areas of the business. Petra was very proud to tell the participants about the robotic window cleaners, which clean approximately two hectares of the greenhouse exterior surface overnight. While the capsicums are hand harvested, they are then stored in trolleys that automatically follow a track to the washing and packing area of the facility.

Participants were inspired by Petra's energy and passion for Barendse DC and agreed that she had successfully marketed the business, offering detailed guided tours as a value-adding factor.

Participants with Petra Barendse (front centre).

The final stop for the day was Pater Broersen, which produces various lettuces including iceberg lettuce, cabbage and kale. Director Dick Pater met the participants and explained how the company was the first to implement the sustainable technique of growing lettuce in water outdoors in 2011. The growing pools consist of 5,000 square metres of floating plastic trays which hold the lettuce head while the roots grow into the water, resulting in nutrient leaching and significantly lower water consumption. Excess rainwater is also collected and stored so it can be used later for cultivation.

While the participants were impressed with this particular type of growing method, it was noted that it was important to ensure the water was constantly circulating to avoid any cases of listeria development.

Dick Pater explains Pater Broersen's success with lettuce cultivation in water.

Day 6: Thursday 5 November

Netherlands: Hoogendoorn Growth Management, Svensson, Codema, Rijk Zwaan, Van der Hoeven, greenhouse visits and Market Hall

The meetings held today were primarily focused on greenhouse production, as this is the mainstream method of growing vegetables in the Netherlands. The group travelled to the headquarters of Hoogendoorn Growth Management in Vlaardingen to meet with the company and its four partner representatives. The participants were pleased that the companies had all made an effort to include female representatives, once again reinforcing the importance of recognising the vital role that women play in the global horticulture industry.

Participants with representatives from Hoogendoorn Growth Management, Svensson, Codema, Rijk Zwaan and Van der Hoeven.

Hoogendoorn representative Natascha Faessen led the presentations by providing an overview of the company, which aims to deliver sustainable automation solutions that result in the efficient use of available resources such as natural gas, fertilisers and water. She also explained the company's next generation iSii processing computer for use in greenhouses of the future.

Participants also heard from Svensson Marketing Manager Dasha Koptina, who explained the company's role in creating climate screens and interior textiles for use in greenhouses, and how the product line can help a grower achieve a lower carbon footprint.

Codema Systems Group representative Marja Hulst discussed how the company provides growers and investors with tailor-made cultivation solutions, logistic systems, management and control systems and software for the horticultural industry. She added that Codema is also working with Sundrop Farms, which is currently building a high-tech greenhouse near Port Augusta in South Australia.

Bauke van Lenteren from seed company Rijk Zwaan was a familiar face to many participants who deal with the Australian division of the independent family company. While Rijk Zwaan currently has more than 1,200 seed varieties in 28 crops, Bauke explained the company is always looking for continuous growth and investment in R&D. One of the more recent developments is Knox, a trait that has been introduced into the company's lettuce varieties to slow down the pink discolouring that occurs after cutting. The trait ultimately extends shelf life by approximately two days.

Finally, Daphne Kramer presented on Van der Hoeven, which provides growers with tailor-made solutions on the design and fabrication of greenhouses. She explained the company's new ModulAIR

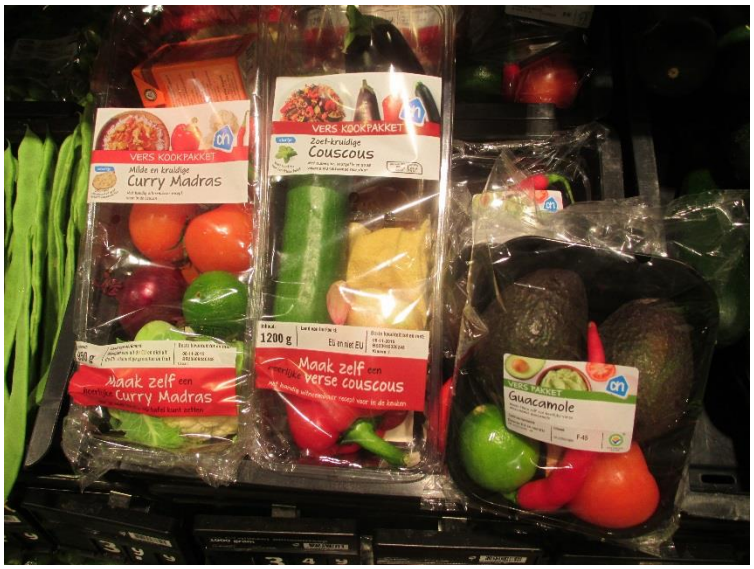
concept, which aims to produce a better controlled greenhouse that optimises energy and reduces carbon dioxide emissions, while also resulting in fewer pests. Van der Hoeven is also working on the Sundrop Farms project to provide a 20 hectare turnkey ModulAIR solution.

Following the presentations, the group travelled to two greenhouses to view the systems and machinery in action. The first was small-scale capsicum grower Duÿndam, which currently has the ability to produce capsicums that weigh 261g, with the potential to increase. The second greenhouse, Kwekenij Zwethlande, produces one million pot plants per year. While not a vegetable-focused business, the participants were still able to gain an appreciation for the greenhouse operation and use the business as a point of comparison to the vegetable industry. The group agreed that there were many advantages associated with greenhouse production, particularly in terms of easily incorporating automation.

The sorting machine at Duÿndam, where red capsicums are marketed using the brand 'Paprika's Perfekt Bell Peppers'.

In the afternoon, the group travelled to Rotterdam to visit the world-famous Market Hall (Markthal), which houses a series of fresh food stalls and restaurants beneath a giant arc. Participants were able to walk through the stalls to view the produce on offer, as well as visit one of the main supermarket chains in the Netherlands, Albert Heijn, where they compared the quality and pricing of fresh fruit and vegetables. Many noted the innovative ways that vegetables are being used in a value-added form and the high amount of processed foods on the shelves compared to Australia.

Some examples of the fresh produce on display at Market Hall in Rotterdam.



Fresh and frozen produce at an Albert Hein supermarket in the Netherlands.

Day 7: Friday 6 November

Belgium: Hesbaye Frost

After a variety of informative meetings in the Netherlands, the group crossed the border into Belgium to visit Hesbaye Frost, a frozen vegetable processor based in the rich Hesbaye region of Geer. What began as a 17th Century farm now houses Hesbaye Frost's modern processing factory, which produces more than 100,000 tonnes of net frozen product annually in conjunction with its two partners, Crop's NV and Ardo. These frozen vegetable products supply the retail and food service industry, and are exported mostly to surrounding European countries such as Germany and the United Kingdom.

The company prides itself on sourcing its vegetables from local producers, with 85 per cent of the vegetables grown within a 40 kilometre radius of the factory. The local growers are grouped into a production organisation called Unigrow, which allows Hesbaye Frost to contract directly with more than 500 growers, sub-contractors, researchers and transport companies in the region. In addition, six on-site agronomists work with the growers from the purchase of seed to the intake of harvested product.

Hesbaye Frost processes a range of vegetable commodities throughout the year, including leafy vegetables such as spinach (April to June), peas, sugar snap peas, broad beans and green beans which represent approximately 34,000 tonnes of the company's frozen product (June), root vegetables including carrots, potatoes and parsnips (August to February) and Brussels sprouts (October to December).

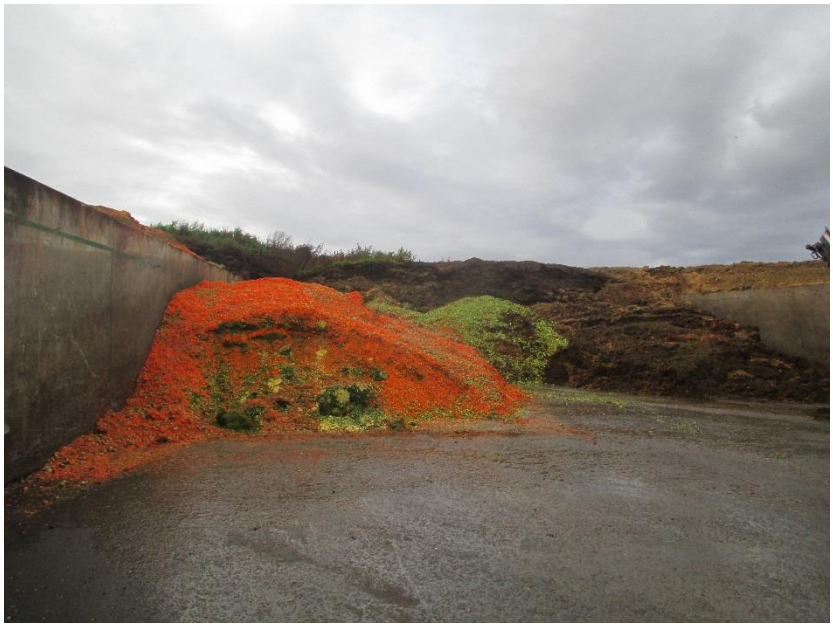
Hesbaye Frost invests between €5-6 million per year on average in the areas of automation and storage facilities. The benefits of such an investment were evident when participants toured the impressive processing factory and learnt of the company's aim to process peas within 150 minutes to ensure the majority of essential nutrients are retained. There are four flexible production lines within the factory with a production capacity of 36-44 tonnes per hour, as well as six packing lines and one mixing line that is typically used to mix peas and carrots. The company also introduced organic pea processing in 2014, in response to the growing market potential for organic products.

It is clear that sustainability is also an important aspect of Hesbaye Frost's business plan after participants visited the biomethane plant located nearby, which recycles approximately 20,000

tonnes of vegetable waste per year. This plant was built as a cooperative with local farmers and produces gas from the fermentation of waste vegetables, which is mixed with other ingredients to supply 25 per cent of the factory's electricity needs. In addition, a nature reserve has been built to give back to the community and attract wildlife to the area.

While the participants appreciated the tour of Hesbaye Frost's processing factory and extensive hospitality, they were also impressed that the company had made such a concentrated effort to introduce environmentally-friendly and sustainable operations to its overall business plan.

Due to intellectual property concerns, photos were not allowed to be taken at Hesbaye Frost's processing facility.



Approximately 20,000 tonnes of vegetable waste is used per year to power Hesbaye Frost's biomethane plant, which supplies 25 per cent of the factory's electricity needs.

Day 8: Saturday 7 November

Belgium – Switzerland: Travel day

Due to circumstances beyond our control, the group was unable to visit supermarkets after arriving in Switzerland as originally planned. However, the participants visited a variety of supermarkets in the Netherlands and Germany during their free time, as well as Luxembourg on the way to Switzerland. This opportunity allowed them to examine the different ways that growers and retailers present fresh produce on the shelves, as well as the different varieties of produce and product offerings available to consumers.

Day 9: Sunday 8 November

Switzerland: Rest day and Syngenta networking dinner

After enjoying a rest day in Basel, the group met with Syngenta Global Asset Manager Kristel Burgemeister for a networking dinner. Kristel is originally from Australia and previously managed Syngenta's Cereal Herbicides division in Australia and New Zealand before moving to Basel in April.

The participants enjoyed meeting Kristel and discussing their visit to Syngenta Seeds, as well as the upcoming tour of the company's research facility based in Stein, Switzerland.

Day 10: Monday 9 November

Switzerland – Germany: Syngenta Stein research facility and travel day

To kick off week two of the 2015 Women in Horticulture Mission, participants travelled to Syngenta's state-of-the-art research facility based in Stein, near the Swiss-German border. The group met with Dr Gertrude Knauf-Beiter, Head of Biotic Stress Management, who explained that Stein is the centre for the company's Crop Protection Research Biology in fungicides, insecticides and professional products.

The Stein facility is one of Syngenta's four research centres and involves sectors dedicated to research, biology, field trials, seed care and chemistry. It consists of custom-designed buildings including 4,200 square metres of greenhouses, 70 walk-in growth chambers and 1,800 square metres of laboratories. Both the greenhouses and growth chambers are climatically controlled to ensure that conditions meet the individual needs of the insect pests and fungal plant diseases. Needless to say, this facility is a clear reflection of Syngenta's decision to invest more than $1.4 billion in R&D, as the main purpose of the Stein research facility is to evaluate chemical and biological crop protection products to protect plants against fungi, insects and nematodes.

The participants were given a tour of the Insect and Disease Control sectors of the site, which form an integral part of Syngenta Stein's global R&D program. They discovered how hundreds of thousands of chemicals are tested each year in minute quantities to detect active compounds among inactive chemicals. The compounds showing relevant activity are tested again in smaller quantities, using the pest or pathogen on a small plant or leaf piece to focus on the most promising lead areas. These promising chemicals are then tested on plants, insects or fungal diseases under conditions as close as possible to those in a grower's field. Field tests then take place in major agricultural systems covering different climatic conditions and soil types before one chemical is tested under significant quantities and a product is registered and launched.

Participants enjoyed the tour of the facilities and the chance to witness the amount of time, resources, technology and infrastructure used to develop and test chemical formations for both insect and disease control.

Due to intellectual property concerns, no photos were allowed to be taken at the Syngenta Stein research facility. Following the visit, the group travelled to Hanover, Germany for the final stage of the mission.

Day 11: Tuesday 10 November

Germany: Agritechnica trade show

Day 11 of the mission was dedicated to Agritechnica, the world's largest trade show for agricultural machinery and equipment. Alongside 2,907 exhibitors and around 450,000 local and international visitors, participants gained an insight into the latest innovations in farm machinery and technology.

Held every two years, Agritechnica is widely considered to be a driving force for innovation and inspiration in the global agriculture industry. The latest innovations in agricultural machinery were presented, ranging from sensor-based information collection systems to high precision farming equipment. This year's event also featured a cross-industry component that focused on systems,

modules, components and parts suppliers, as well as a program on careers in agricultural machinery and scientific research.


A bunching machine (left) and the popular John Deere stand at Agritechnica.

Many participants pre-prepared a list of companies and sectors to visit during the day, which included the extensive John Deere display and sectors dedicated to harvesting and packaging. After walking between more than 20 buildings that made up Agritechnica, participants were able to develop contacts and take home information that will undoubtedly assist the operation of their farms in the future.

Day 12: Wednesday 11 November

Germany: Travel day and Rudolf Sinn GmbH

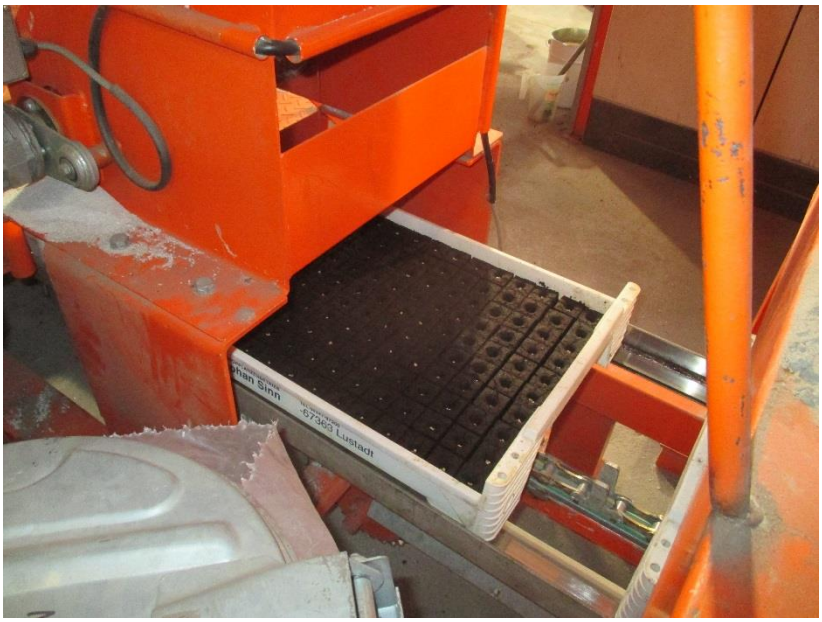
After travelling from Hanover to Mannheim, the group visited the nearby vegetable growing area of Lustadt, which is home to seedling grower Rudolf Sinn GmbH. Stephan Sinn, who is responsible for the sale of seedlings and organisation of production, fertilisation and plant protection, led the group through the facility, which produces around 100 million seedlings per year (including 15-18 million organic seedlings per year) to customers in southwest Germany, Austria and France. The seedlings cover a range of vegetable commodities including baby leaf, spinach, corn salad, parsley and celeriac.

Founded in 1978, the company has repeatedly expanded and modernised over the years and now boasts a greenhouse area of 51,000 square metres. In addition, Stephan gave the group a demonstration of the automatic transport system, which allows for optimal efficiency when stacking, transporting and loading seedling trays.

Automation makes it easy to stack and transport seedling trays at Rudolf Sinn GmbH.

The group also walked through the latest addition to the business – a new greenhouse and refurbished germination rooms, which were completed in February 2015. The new structure is five metres high to allow for more air and a better climate for the seedlings, as 80 per cent of light now enters the greenhouse. The greenhouse has a modular setup, which can be altered from one department or adjusted to six smaller ones to help regulate the temperature, while the new F-clean film on the roof has the advantage of allowing maximum UV light transmission.

Rudolf Sinn GmbH also manufactures its own organic and conventional peat boxes. Interestingly, they are both manufactured in the same area of the facility, with some participants noting that this highlights the difference in rules and regulations regarding organic production in Australia and Europe.



Rudolf Sinn GmbH also manufactures its own organic and conventional peat boxes.

The participants enjoyed the visit and the chance to see greenhouse production through all of its processes. It once again opened their minds to the benefits of greenhouse production in the vegetable industry.

Stephan Sinn (left) speaks to participants during the visit to Rudolf Sinn GmbH.

Day 13: Thursday 12 November

Germany: John Deere European Headquarters

The final stop on the 2015 Women in Horticulture Mission was John Deere's European Headquarters, which houses the company's largest factory outside of the United States. The facility spans more than 40 hectares and churns out 30,000 tractors per year, with one tractor leaving the assembly line every three minutes. The Mannheim facility alone has produced 1.72 million tractors since 1921, when Heinrich Lanz began producing Lanz Bulldog one-cylinder tractors on the site.

Participants learnt that the company invests more than $5.6 billion in R&D worldwide per day and designs, tests and manufactures the key components of its machinery. A dynamic testing facility tests the tractors in the most extreme environment for key factors such as wear and tear and its operation in different temperature conditions.

All tractors are produced on demand and custom-made to suit the customer's specifications, as each farmer has different requirements. This also means that it takes about eight years before the factory produces two tractors that are exactly the same. Participants also found that the export market is an important one for John Deere, as 90 per cent of its tractors are exported to 100 countries across the world.

Following a presentation at the John Deere Forum, the group geared up for the tour of the Mannheim factory, which exceeded their expectations. This facility produces small to medium-sized 6MC, 6RC, 6M and 6R series tractors before the finished product is delivered to the nearby Mannheim Harbour and shipped along the Rhine River to its next destination.

Quality control checks are evident at every stage of the production line, as each tractor is assigned a unique build tag to reflect the specific customer's requirements. Needless to say, the scale and

efficiency of the production line certainly has to be seen to be believed, as each component seamlessly works together to ensure that one tractor is ready for shipment every three minutes.

Participants test out a tractor on display at the John Deere Forum.

Following the factory tour, the group stopped by the John Deere Museum, which clearly reflected the rich history of the company that began as Heinrich Lanz AG before John Deere took over in 1956. Participants also climbed up into the cabs of a selection of finished tractors at the Forum for a first-hand experience of the fittings and latest technological developments in the product line.

With many John Deere customers in the group, participants thoroughly enjoyed the tour of the factory and seeing the tractor manufacturing process from start to finish, with many noting that this was the first time they had witnessed such a production line. In particular, they received a great insight into John Deere on a global level and the technology and innovation used in the company.

Due to intellectual property concerns, no photos were allowed to be taken at the John Deere factory.

Day 14: Friday 13 November

Germany – Australia: Travel day

After two weeks of insightful visits and the opportunity to forge strong networks with local and international colleagues, participants returned to their respective home states, bringing with them an array of new information and knowledge gained from the mission.

4.0 Implications for Australian horticulture

The 2015 Women in Horticulture Industry Leadership and Development Mission provided the delegation of eight Australian vegetable growers with the chance to network with leading growers, researchers and industry representatives throughout the Netherlands, Belgium, Switzerland and Germany, as well as each other. As a result, the participants have forged strong and lasting contacts that will remain long after the mission's conclusion.

Given the diverse range of experience and knowledge of the participants, many important discussions were held on the different experiences of working as a female in the Australian vegetable industry, the opportunities to develop further in terms of knowledge and skills, and new ideas to implement in their respective businesses. The mission highlighted to participants the importance of working together as an industry and supporting each other through the prosperous times, as well as the tough times.

Throughout the four countries visited, it became clear that protected cropping is an important growing method for the European vegetable industry. The participants visited a wide variety of greenhouses throughout the mission, which highlighted the value and benefits of incorporating such a model into their businesses. Many participants mentioned that the scale of the majority of farms visited outweighed Australian growing operations, but this gave them a greater appreciation of how their colleagues in Europe manage production on a larger scale.

The two-week mission also highlighted the important role that research, advanced technology and automation can play in a vegetable growing operation. Australian vegetable growers should look to adopt as much automation into their businesses as possible, as this will not only help to reduce high labour cost but will also ensure their operations remain as efficient as possible. Many growers identified new growing techniques, such as lettuce cultivation in water and bird-deterring laser technology as promising solutions for implementation in the Australian vegetable industry.

Another important factor was the concentrated effort of many companies to actively play a role in sustainability and conservation. Many European vegetable growers are looking to innovate and use alternative sources of energy for their needs, particularly in terms of heat for greenhouses or electricity for machinery. These visits highlighted the financial benefits that could come from implementing such technologies into a vegetable grower's business. While this decision would involve a high financial outlay initially, it undoubtedly has the potential to bring increased economic benefit to a business in the future.

During the mission, many participants came across innovative ways to value-add or create an off-farm income, noting the importance of diversifying to remain profitable as a business. In addition, the visits to supermarkets, wholesale markets and fresh food retail stores highlighted the creativity that some European growers have used to design packaging that is highly appealing to the consumer. Some of these products were borne purely out of consumer demand, which reinforces that Australian vegetable growers have an opportunity to look more closely at what the consumer desires, especially when it comes to convenience. In particular, levy-funded consumer research projects conducted for the vegetable industry are a great source of information and inspiration for growers to gain a detailed insight into the mind of the Australian consumer.

Finally, it is important that participants remain in contact with each other as well as their European counterparts. Creating strong and long-lasting business relationships will result in valuable information being shared among Australian vegetable growers for the benefit of the industry as a whole.

5.0 How the information gathered will be disseminated

Since the completion of the mission, AUSVEG has encouraged participants to share information on what they have learnt and experienced with their Australian peers throughout their industry networks, as well as ensuring they participate in future industry events, workshops and seminars. Participants have also remained in contact with each other since the conclusion of the mission, where they have continued the discussion on their new-found insights into vegetable growing technologies and emerging trends overseas.

In particular, AUSVEG has actively encouraged participants to share their new knowledge with delegates at the 2016 National Horticulture Convention. Participation at the Convention will provide an opportunity to access a large portion of the horticulture industry in one place and, in doing so, facilitate the opportunity to engage with colleagues in the industry and share their knowledge and experiences.

AUSVEG will also publish an article in an upcoming edition of *Vegetables Australia*, communicating the key findings from the mission. This will cover information from the meetings held and other important information discovered as a result of the mission. The magazine is the most widely distributed publication in Australian horticulture, as it is received by approximately 6,000 industry members. In addition, AUSVEG has already published a news item on the mission in the Weekly Update e-newsletter, which is distributed to approximately 4,000 industry members.

A selection of meetings held during the 2015 Women in Horticulture Industry Leadership and Development Mission were also reported in international media, including Bird Control Group and HortiDaily.

Participants may also be invited to share their experiences at industry seminars arranged, organised, facilitated and/or communicated by AUSVEG and other vegetable industry organisations. The contact details and relationships built throughout the mission will also be used to facilitate future discussions and continue the process of sharing information.

6.0 Itinerary

Day	Itinerary
Saturday 31 October – Sunday 1 November	**Melbourne – Dubai – Amsterdam, Netherlands** On Saturday, catch your domestic flight to Melbourne to meet with the group and then fly to Amsterdam. **11.25pm: Depart Melbourne on Qantas Flight QF0009/EK5009** **6.30am: Arrive Dubai** **8.10am: Depart Dubai on Qantas Flight QF8147/EK0147** **12.40pm: Arrive Amsterdam on Sunday 1 November** On arrival at Amsterdam we will be transferred to the hotel. Meet in the hotel lobby at 4.30pm for an evening cruise along the picturesque canals of Amsterdam before a group welcome dinner. **Accommodation** WestCord Art Hotel Amsterdam Spaarndammerdijk 302, 1013 ZX Amsterdam, Netherlands Phone: +31 20 410 9670
Monday 2 November	**Amsterdam – Delft – Monster – Amsterdam, Netherlands** **7.45am:** Depart hotel and travel approximately one hour to Delft. **9.00am to 1.00pm:** To kick off the mission, visit Bird Control Group, which develops animal-friendly solutions to keep birds at a safe distance and prevent damage to vegetable crops. Following a presentation from Agrilaser Sales Director Corné Sweep and Sales Support Specialist Ali Ahmed, travel to an open greenhouse in Reeuwijk where the Agrilaser Autonomic is in use. **3.30pm to 5.00pm:** After lunch in Delft, we will make our way to Monster to visit Koppert Cress. The company specialises in cresses – the seedlings of unique plants, which each have their own specific effect on the senses. Return to the hotel for a free evening. **Accommodation** WestCord Art Hotel Amsterdam Spaarndammerdijk 302, 1013 ZX Amsterdam, Netherlands Phone: +31 20 410 9670
Tuesday 3 November	**Amsterdam – Enkhuizen – Amsterdam, Netherlands** **9.40am:** Depart hotel **10.00am to 11.30am:** Witness the hustle and bustle of the Food Centre Amsterdam during a guided tour of the city's wholesale food market, which offers the largest and most versatile range of fresh produce in the Netherlands.

	1.00pm to 2.30pm: After lunch we will visit Enkhuizen, home of Syngenta Seeds. Kim Gieling, Corporate Affairs Business Partner and Marjan Vlam, Seed Health Leader will greet you with a welcome coffee before meeting cauliflower breeder Joep Boon, who will explain Syngenta's breeding efforts and success with Clubroot in their greenhouses. You will also visit the Seed Health lab where Marjan will discuss the company's activities in brassicas and cucurbits. Enjoy a free evening. **Accommodation** WestCord Art Hotel Amsterdam Spaarndammerdijk 302, 1013 ZX Amsterdam, Netherlands Phone: +31 20 410 9670
Wednesday 4 November	**Amsterdam – Zwaagdijk – Amsterdam, Netherlands** **8.10am:** Depart hotel and travel to Zwaagdijk. **9.00am to 10.30am:** Visit Proeftuin Zwaagdijk, where we will be given a guided tour of this important agricultural resource centre. The company holds field trials at over 100 locations in the Netherlands and offers high quality research to the industry. Following the tour, take a 20-minute drive to Barendse DC. **11.00am to 1.30pm:** At Barendse DC, you will tour the world's largest nursery of orange capsicums. After morning tea, listen to a presentation on Barendse DC and Agriport A7 before a visit to the sorting and packaging area of a greenhouse. **2.30pm to 3.30pm:** After lunch, visit Pater Broersen lettuce nursery before returning to Amsterdam. After a short break, meet in the hotel lobby for a group dinner. **Accommodation** WestCord Art Hotel Amsterdam Spaarndammerdijk 302, 1013 ZX Amsterdam, Netherlands Phone: +31 20 410 9670
Thursday 5 November	**Amsterdam – Vlaardingen – Rotterdam, Netherlands** **7.45am:** Depart hotel and travel one hour to Vlaardingen. **9.00am to 1.00pm:** Today will be a greenhouse-themed visit to Hoogendoorn Growth Management. This company specialises in process computers and you will also hear from their industry partners including Van der Hoeven (greenhouse construction), Svensson (climate screens), Rijk Zwaan (seeds) and Codema (installer). Following the presentations, you can view the systems in action with a visit to two greenhouses. After lunch, we will drive to Rotterdam and visit the famous Market Hall (Markthal), which hosts a series of food stalls beneath a giant arc. Enjoy a free evening in Rotterdam. **Accommodation** Holiday Inn Express Rotterdam – Central Station

	Weena 121, 3013 CK Rotterdam, Netherlands Phone: +31 10 820 2990
Friday 6 November	**Rotterdam, Netherlands – Brussels, Belgium** **8.00am:** Depart hotel. **11.00am to 4.00pm:** Wave goodbye to The Netherlands and say hello to Belgium as you visit Hesbaye Frost in Geer. This company is a supplier of Simplot Australia and we will be touring its processing factory located in the rich Hesbaye region of Belgium. After lunch and a presentation on the company, you will visit the bio mechanisation system, natural reserve and tour the factory. Return to Brussels for a free evening in the Belgian capital. **Accommodation** Novotel Brussels Off Grand'Place 120, Rue Du Marche aux Herbes, 1000 Brussels, Belgium Phone: +32 2 620 0429
Saturday 7 November	**Brussels, Belgium – Basel, Switzerland** Fly from Belgium to Switzerland. **5.00am: Depart hotel** **7.05am: Depart Brussels on Lufthansa Flight LH1025** **8.10am: Arrive Frankfurt** **9.20am: Depart Frankfurt on Lufthansa Flight LH1202** **10.10am: Arrive Basel** After checking in to the hotel, visit a selection of local supermarkets to see the innovative ways in which growers are showcasing their produce to consumers and how they are displayed on the shelves. Enjoy a free afternoon and evening in Basel. **Accommodation** Hotel D Blumenrain 19 Basel, Switzerland 4051 Phone: +41 61 272 2020
Sunday 8 November	**Basel, Switzerland** Today you can relax and see the beautiful sights of Basel. **7.00pm:** Meet with Kristel Burgemeister, Syngenta Global Asset Manager – Soybean Herbicides for a networking dinner at Kohlmanns (Steinberg 14, CH-4001 Basel). Kristel is a fellow Aussie and previously managed the Cereal Herbicides division in Australia and New Zealand before moving to Basel in April. **Accommodation**

	Hotel D Blumenrain 19 Basel, Switzerland 4051 Phone: +41 61 272 2020
Monday 9 November	**Basel, Switzerland – Hanover, Germany** **8.15am:** Depart hotel and travel to Stein, about half an hour from Basel. **9.00am to 1.00pm:** Visit the Syngenta Stein research facility, which includes custom-designed glasshouses, growth chambers and laboratories. After lunch, we will return to Basel airport for our flight to Hanover. **4.45pm: Depart Basel on Lufthansa Flight LH2399** **5.45pm: Arrive Munich** **6.35pm: Depart Munich on Lufthansa Flight LH2102** **7.40pm: Arrive Hanover** Travel to our hotel in Bad Fallingbostel, which is about 45 minutes from the Agritechnica trade show. **Accommodation** Lieth-Hotel-Grünreich Kolkweg 13 Bad Fallingbostel, 29683, Germany Phone: +49 5162 900226
Tuesday 10 November	**Agritechnica trade show, Hanover, Germany** **9.00am:** Depart hotel. **10.00am to 4.00pm:** Visit Agritechnica, the world's largest trade show for agricultural machinery and equipment. Almost 2,900 exhibitors from 47 countries will be presenting ag machinery for professional plant production, and you will have the day to browse what's on offer. Enjoy a free evening after returning to the hotel. **Accommodation** Lieth-Hotel-Grünreich Kolkweg 13 Bad Fallingbostel, 29683, Germany Phone: +49 5162 900226
Wednesday 11 November	**Hanover – Mannheim – Lustadt – Mannheim, Germany** **6.50am:** Depart hotel and travel to Hanover Hbf. **8.41am:** Board the train to Mannheim (ICE 973). The journey will take 3.5 hours. **1.00pm to 2.30pm:** Visit Rudolf Sinn GmbH, a leading vegetable grower in Lustadt, where you can witness corn salad in production and discuss mutual areas of concern and interest with the growers. Return to Mannheim, where you can enjoy a free evening.

	Accommodation Best Western Premier Steubenhof Hotel Steubenstrasse 66, 68199 Mannheim, Germany Phone: +49 621 819100
Thursday 12 November	**Mannheim – Frankfurt, Germany** **8.45am:** Depart hotel. **9.00am to 2.00pm:** Our final stop on the 2015 Women in Horticulture Mission will be the John Deere European Headquarters, based in Mannheim, where you can witness high quality German engineering in the trademark green and gold tractors. After a welcome video and coffee, you will tour the factory and visit the museum and exhibition room, followed by a quick visit to the John Deere Forum. After lunch, we may also be treated to a product presentation from the marketing team. **3.15pm:** Board the train to Frankfurt (ICE 72) and check in to the hotel. After a short break, meet in the lobby for a final group farewell dinner. **Accommodation** Hotel Europa Life Style Frankfurt Baseler Strabe 17 Frankfurt am Main 60329, Germany Phone: +49 6923 805890
Friday 13 November	**Frankfurt, Germany – Australia** After a free morning, make your way to Frankfurt International Airport for your respective flights back to Australia. Please consult your flight itinerary for more information.
Saturday 14 November	**Arrive in Australia**

7.0 Recommendations

The 2015 Women in Horticulture Industry Leadership and Development Mission received excellent feedback from the participants. They were impressed with the level of organisation and leadership shown, particularly when alternative travel arrangements had to be made within Europe due to circumstances beyond our control.

Based on feedback from participants and observations made during the mission, the following recommendations are provided.

- Due to the timing of the mission, the majority of vegetable growing operations had reached the end of the growing season and many were in the process of cleaning up crops and preparing for the new season. While it is impossible to organise the timing of a grower mission to suit all participants, given the variation in crop cycles across commodities and states, it is suggested that the Women in Horticulture Mission be held from July to September to witness maximum production in the Northern Hemisphere, or earlier in the year to incorporate a visit to Berlin Fruit Logistica or field days held by seed companies.

- Given the harsh winters experienced in Europe, protected cropping is a predominant approach to vegetable growing throughout the countries visited. However, participants suggested incorporating more open field vegetable growing operations where possible, particularly brassica crops including cauliflower and broccoli.

- While the group appreciated the opportunity to visit the Agritechnica trade show, the majority of participants agreed that it would be more beneficial to a participant with an engineering background or the primary decision maker for machinery purchases on farm. Most of the displays at Agritechna were targeted at broad acre harvesting or were only available in Europe, while only a small portion of the trade show was relevant to vegetable growing operations. Participants strongly advised incorporating Agritechnica into a general grower mission rather than the Women in Horticulture Mission.

- The participants were pleased that some companies made an effort to organise female tour guides and presenters for the meetings, as this reinforced the important role that women play in the global horticulture industry. When organising meetings for the Women in Horticulture Mission, it is recommended that the tour leader ask for female representatives where possible.

- Train travel was used as an alternative to the European domestic flights, which were both cancelled. However, the participants preferred this method of travel and suggested that it be considered as a preference to flying when travelling between countries in Europe.

8.0 Acknowledgements

The 2015 Women in Horticulture Industry Leadership and Development Mission was funded by Horticulture Innovation Australia Limited using the National Vegetable Levy, contributions from Australian vegetable growing businesses and funds from the Australian Government.

The mission, including Agritechnica registration, travel, accommodation and meetings, was organised by AUSVEG Ltd.

Thanks must go to the many growers and industry representatives who showed participants through their operations and enlightened them with their business skills and knowledge. Thanks must also go to Syngenta and John Deere for accommodating the group.

9.0 Tour participants

Name of participant	Company	Position	State
Heidi Radcliff	Rhebanvale	Director	TAS
Leanne Pippo	Fresh@Heart	Director	NSW
Tamra Newman	Hills Fresh	Director	SA
Desley Jackwitz	Imperial Produce	Director	QLD
Gillian Hay	Bulmer Farms	Pack house/Sales/QA Manager	VIC
Jo Tubb	Simplot	Field Officer – Tasmania	TAS
Claire Russell	Houston's Farm	Senior Agronomist	TAS
Lisa Steinke	Rugby Farm	Senior Agronomist	QLD
Dimi Kyriakou	AUSVEG	Tour Leader	VIC