

Final Report

2018 Women's and Young Grower Industry Leadership and Development Mission

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2018 Women's and Young Grower Industry Leadership and Development Mission – VG15703

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Summary

The 2018 Young Grower Industry Leadership and Development Mission provided an opportunity for a group of eleven emerging leaders in the Australian vegetable industry to visit innovative growing operations, research facilities, agribusinesses, markets and retailers in New Zealand and California.

From 9-21 April 2018, the group travelled to the North Island of New Zealand and California to visit two major vegetable growing regions in the U.S.A. and New Zealand. The two-week tour led by AUSVEG began in Wellington, New Zealand, where the group visited growers in the Horowhenua region, including long-time industry member Andrew Yung and Woodhaven Gardens. Participants then travelled to Hawke’s Bay, a hub of vegetable growing production in New Zealand, where participants met with Lawson Organic Farms and Bayley Farms, as well as having lunch with Dianne Vesty from the Hawke’s Bay Fruitgrowers’ Association at Bostocks’ Kitchen. The group also had an opportunity to visit the Pukekohe growing region and met with some of the biggest vegetable growers in New Zealand in A.S. Wilcox & Sons and Sutherland Produce, as well as visit researchers from Plant and Food Research New Zealand. The group also visited retailers and markets in Auckland on their final day in the country.

The group then travelled to California where they examined the similarities and differences in a range of horticultural crops compared with both the Australian industry and the New Zealand industry, providing an opportunity to see how other industries are tackling ongoing challenges in improving productivity and profitability. In California, participants met with leading irrigation company Toro and visited some of the biggest carrot growers in the world, Bolthouse Farms and Grimmway Farms, in Bakersfield. The group then travelled to Salinas where they met with leading leafy vegetable producers Rio Farms and Tanimura & Antle, as well as visiting the Western Growers Centre for Innovation and Technology to discuss the opportunities for agtech startups to help growers make more informed business decisions using data and technology. The tour finished with visits to two of the world’s leading agribusinesses: Monsanto and Bayer Biologics.

Following their return to Australia, participants shared their new-found knowledge with friends and colleagues to disseminate the key insights discovered from the mission to the wider Australian vegetable growing community. Coverage of the mission will appear in a future edition of *Vegetables Australia*, the most widely distributed magazine in Australian horticulture, as well as AUSVEG’s Weekly Update e-newsletter and social media channels.

The mission allowed participants to experience the large scale of horticultural production in New Zealand and California, providing a clearer insight into industry nuances, production practices, new technologies and issues facing growers in those countries. Participants were exposed to production practices in a range of horticultural crops, as well as the ways that growers are incorporating sustainable initiatives and value-adding elements to their businesses. Most importantly, participants were able to expand their local and international networks and broaden their knowledge and understanding of the vegetable and wider horticultural industries. Upon their return to Australia, attendees planned to review the strategic direction of their businesses and incorporate new ideas and technologies into their growing operations. As these young growers step into leadership roles in our industry, these networks and experiences will help them provide valuable input into industry-wide activities, such as guiding future research and development.

Monitoring and evaluation was conducted through written evaluations that were completed by participants to provide a record of each day’s events and ensure information was retained, while debriefing sessions were held throughout the mission to discuss key points of interest.

It is recommended that future industry leadership and development missions for the vegetable industry are combined into one project to streamline administration and reporting requirements and to include, where practicable, more face-to-face time with international growers to discuss their growing operations and practices.

Keywords

Industry Leadership and Development; vegetable industry; New Zealand; United States; U.S.A. horticulture; networking; grower mission; grower tour; young grower; New Zealand vegetable production; American vegetable production; new technology; biologicals; vegetable research; California vegetable production; Salinas Valley; Bayer Biologics; AUSVEG; Hort Innovation.

Introduction

For many years, Australia’s vegetable growers have benefited from the opportunity to attend international grower tours to key vegetable production regions around the world. These tours have successfully allowed participants to be exposed to the global horticulture industry and meet their peers in different countries to discuss similar challenges and practices, as well as those specific to the regions visited.

The ability to temporarily step away from Australian horticulture and gain a new perspective on the industry has helped to foster innovation in the Australian vegetable industry, as participants have brought back new knowledge and practices to improve the efficiency and profitability of their operations. Upon their return, participants have also shared their findings with their networks and through industry communications, allowing the wider Australian vegetable industry to benefit from the tour.

The importance of developing the skills, knowledge and leadership capabilities of the industry’s young members was a key objective for the 2018 Young Grower Industry Leadership and Development Mission. New Zealand and the United States of America were identified as ideal locations for the mission as they are two of our closest allies, with their industries sharing many similarities to Australia’s own while also offering learning opportunities. The mission provided an opportunity for young Australian vegetable growers to learn from their international peers and forge long-lasting networks with growers and agribusinesses in these countries and allowed future leaders in the Australian vegetable industry to gain a fresh insight into new production practices, machinery, technologies and strategies that are currently being used to advance the horticulture industry in these two countries.

To ensure participants received the greatest benefit from the mission, the itinerary included visits to key growing regions in New Zealand and California, including Horowhenua, Hawke’s Bay and Pukekohe in New Zealand and Bakersfield and Salinas in California. These areas are all major vegetable growing regions in their respective countries.

Meetings were organised with growers, researchers and agribusinesses to ensure a diverse range of topics were discussed throughout the two-week mission. This included on-farm production practices and innovations (both conventional and organic), packing house and processing developments, key areas for vegetable research, labour sourcing programs, agtech innovation, biological crop protection and vegetable seed protection and production. In addition, participants also visited fresh produce retail outlets to see how produce is presented to consumers and the value-adding options that growers have created to minimise waste and increase profitability.

These specific topics were chosen due to their alignment with the needs of our own industry. As our sector continues to grow and innovate, knowing how our international counterparts have managed production challenges and growing pains – such as increasing to the massive scale seen in some American operations – will help our own growers incorporate the lessons from this tour into their own business management, and will also better equip our industry to handle its future.

Regular debriefings were held throughout the mission to discuss the key insights and highlights from the meetings undertaken. Participants were encouraged to take notes of meetings and completed an evaluation form to provide feedback on the success of the mission, which will contribute to the continuing refinement and development of the industry’s study tour program.

The 2018 Young Grower Industry Leadership and Development Mission was a strategic levy investment under the Hort Innovation Vegetable Fund.

Methodology

A detailed itinerary was provided to the 2018 Young Growers Industry Leadership and Development Mission participants prior to their departure, as well as a hard copy booklet including the mission’s itinerary and participant contact details. Below is a detailed summary of the events and activities that took place during the mission.

Day 1: Monday 9 April 2018

Travel Day

Participants travelled individually from Australia to Wellington, New Zealand. The group met at the airport and travelled to their accommodation before attending a group dinner.

Day 2: Tuesday 10 April 2018

Otaki/Levin

The 2018 Young Grower Industry Leadership and Development Mission began with a bus trip from Wellington to Otaki and Levin, two major vegetable-growing regions in New Zealand’s North Island. The day started with visit to Andrew Yung, a small-sized farmer from Otaki who has grown vegetables in the region for decades; he is currently growing niche vegetable varieties including Florence fennel and Asian vegetable varieties. Andrew’s farm was the smallest visited on the tour, but the visit provided an opportunity to learn about the New Zealand vegetable industry from a long-time grower and industry advisory panel member, which provided the young growers with a perspective on the way that the industry has changed over a relatively short time.



Otaki vegetable grower Andrew Yung addressing tour participants in his garage.

Given the weather event that brought rain and cold weather from the Antarctic had arrived the day before and settled in, the group was unable to tour Andrew’s farms; however, Andrew was generous with his time to speak with the group in his garage. Areas of discussion included:

- Succession planning – Andrew is near retirement and his children are not working on the farm. Andrew does not have anyone to pass on the farm to and is fiercely loyal to his long-time employee of 32 years, which is preventing him from retiring. Many of the growers on the tour are (or began as) family farms, so the realities of succession planning will be front-of-mind when they are older, particularly if their family members do not work on the farm. This is not an isolated issue for Andrew in New Zealand and is representative of a wider-industry issue with the inaccessibility of young people to join the industry without inherited capital and the lack of interest in young members of farming families to stay on the farm.
- Market environment in the New Zealand vegetable industry – the market environment in the industry is dominated by a small number of large retailers that are the dominant buyers of fresh produce. This creates a situation where growers are price-takers, rather than price-makers and make it harder to grow a

profitable business in the industry.

- Price – according to Andrew, vegetable prices have not risen with inflation, meaning that the value of product leaving the farm has been steadily declining over time. This has a detrimental impact on growers’ ability to generate a profit, particularly small growers who cannot take advantage of economies of scale. The New Zealand industry has seen a consolidation in the number of growers in the industry, much like the Australian industry, which means that big growers are getting bigger by acquiring smaller surrounding farms, which cannot compete on cost; this coupled with a low price has changed the look of the industry considerably in the last 20 years.
- Diversification and trends – Andrew is a big believer in researching trends, creating value-added products that appeal to consumers and diversifying your product range to mitigate risk. Andrew was once the country’s biggest fennel grower when it was a more niche product, which was a successful period for his business; but as the product has become more mainstream, he needed to find different avenues to differentiate his business. The shift to Florence fennel, which he grows for local markets, is an example of this.
- Labour and regulation – cost of labour has increased significantly, which is impacting on growers’ costs and is causing a significant amount of pressure on their profit margins. This is coupled with the increased cost and time devoted to government and industry regulation, which affect the ability to operate a profitable business in the industry.
- Improvisation and ingenuity – given Andrew is not a large-scale grower, he was required to be more inventive in solving farm issues – this included modifying and creating unique machinery and technology. Andrew demonstrated an improvised seed-sorting machine out of an oven roasting dish and a vacuum cleaner, and his shed had many more examples of other self-made inventions.



Andrew demonstrating an improvised seed sorter in his shed.

After visiting Andrew, the group travelled by bus to Levin to visit Woodhaven Gardens, a larger-scale vegetable grower. John Clarke, Woodhaven Gardens Director, provided a tour of some of the farm’s sorting, washing and packaging facilities. Woodhaven Gardens produces spring onions, beetroot, kohlrabi, parsley, lettuce, cabbage and other vegetables for the local and international market. Areas of discussion included:

- Starting out – John and Andrew (whom the group visited earlier in the day) were once business partners, but while Andrew consolidated his business and stayed small, John expanded into one of the biggest growers in the region, growing a wide range of products. John started with two acres and now grows over 1,500 acres, demonstrating the scale of his growth. John’s farm initially started out as a seed business, but transformed into a vegetable-growing business after he saw the opportunity to expand his business.
- Urban encroachment – given Levin is increasingly becoming built-up for urban houses, John’s farm is facing increasing issues with residents moving next to the farm. This was highlighted on the day of the tour given the rain that came overnight to Levin resulted in flooding waters moving from the farm to nearby residential properties, causing John to try to stop the flooding from 2am the night before. The growers on the tour recognised the issues that they experience with their own farms, with many of the growers in peri-urban areas facing similar issues with urban encroachment.
- Workers – John mainly hired permanent workers, with many native New Zealanders from the local

community, which provided a more stable workforce.

- The group was able to see the packing and washing facilities in action, with spring onion and parsley packing also underway.



John showing the tour group some lettuce products.



Recently harvested vegetable products at Woodhaven Gardens.



Washing of leafy vegetable products at Woodhaven Gardens.

Following the visit to Woodhaven Gardens the group travelled by bus to Hawke’s Bay.

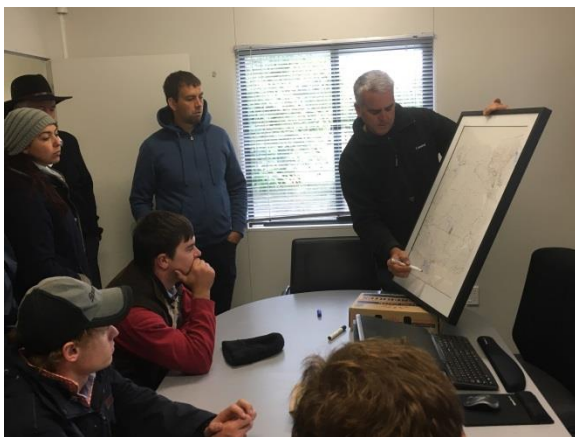
Day 3: Wednesday 11 April 2018

Hawke’s Bay

The first visit for the group was Lawson Organic Farms, one of New Zealand’s biggest organic vegetable and berryfruit producers. Owner Scott Lawson provided the group with a detailed overview of the history of Hawke’s Bay, including looking at historical maps to show the group the different land types that make up the area, the water channels flowing underneath the ground and geological changes to the area in the last 100 years.

Scott provided a comprehensive tour of the packing and machinery facilities of the farm, including showing the group sorting and packaging of organic carrots through an automated sensor and sorting machine. Some key areas of the group discussion included:

- Focus on traceability and packaging – Scott is a big believer in traceability, with each product able to be traced to the specific field that it was grown and harvested and the day it was packaged. Images of the packaging are below, which show the code used to trace products. The consideration of packaging materials is also a focus for Scott, with the packaging (particularly for his organic potatoes) chosen to represent the natural ‘earthiness’ of the organic potato product.
- Soil health – Scott has transformed his business with a focus on soil health to produce healthier products and increase yield. Scott’s mantra is ‘feed the soil to feed the plant’, as opposed to just feeding the plant. This has improved the quality of his product and is helping ensure the health and future productivity of the land on which he grows.
- Workers – the availability and cost of labour is a key consideration for Scott, with local workers unwilling to work on New Zealand farms. Scott spoke of sourcing workers from the pacific region through government programs to make up for the shortfall of local workers, similar to the Seasonal Workers Program in Australia. Scott also noted the cost of labour in New Zealand was one of the highest in the world (not quite as high as Australia), and the requirement for breaks lowers productivity and therefore profitability.
- Diversification of markets – Scott warned the growers on the tour not to rely too heavily on a single market (particularly in export), as diversification of risk was important to mitigate potential business issues.
- Urban encroachment – much like Levin, Hawke’s Bay is becoming increasingly urbanised, and farms are having an increasing number of issues with people taking up residence on the border of farming properties without understanding the realities of living next to a farm.
- Pest and disease – Scott explained the devastating impact of tomato potato psyllid on the New Zealand potato industry and the high cost to industry of controlling the issue.



Scott showing the group a historical map of Hawke’s Bay.



True Earth Organic potato package with unique traceability code.



Scott discussing tomato potato psyllid with the group.



Automated carrot bagging machine that uses sensors to select groups to drop carrots into the bag to get the closest desired weight.

The group had lunch at Bostock’s Kitchen, the cafeteria for one of the biggest farms in Hawke’s Bay (Bostock’s Farms). The kitchen includes a single item on its menu that changes daily and uses seasonal produce. Staff and

workers at the farm are able to purchase their meal from the kitchen, which is also open to the general public. The group was joined by Dianne Vesty, the Executive Officer of the Hawke’s Bay Fruitgrowers’ Association, who provided a history of the region and an overview of the key commodities that the region produces.



Dianne discussing the history of horticulture production in the Hawke’s Bay region with tour participants.

Monday 9th April

Moroccan chicken with preserved lemon, Roasted cauliflower with chick peas and rocket

Tuesday 10th April

Spelt spaghetti and meatballs, Kale and broccoli salad

Wednesday 11th April

Chicken and leek risotto, Green leaf and pumpkin salad

Thursday 12th April

Stir fried pork, Soba noodles, Asian greens

Friday 13th April

Chicken and quinoa patties, Pickled beetroot, slaw, garlic mayonnaise

The Bostock Kitchen menu for the week starting Monday 9 April 2018.

Unfortunately there was no one available from Bostock’s Farms for a tour of the facilities, but we were able to organise a visit with Kevin Bayley from Bayley Farms as an alternative.

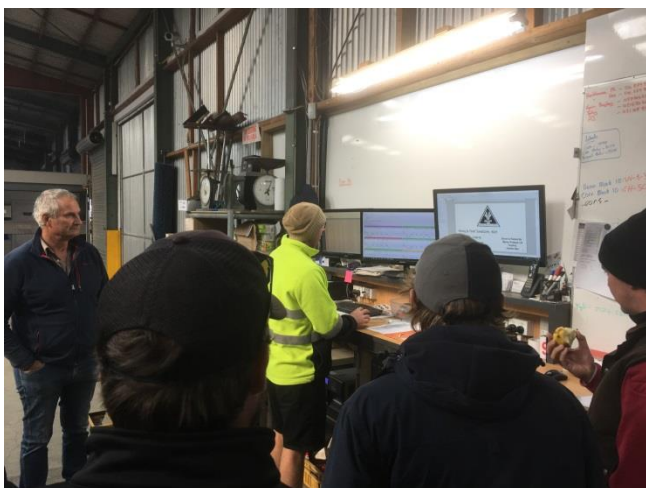
Kevin Bayley produces a wide variety of fruit and vegetables, including beans, corn, apples, pears and watermelons. Kevin moved to the area with nothing and built his business from scratch. Given the boom in the area with wineries and increasing urban settlement, the land prices in the area have risen to a price that this would no longer be feasible.

The farm was coming towards its quiet time for the year, but there were still a few boxes of product in the shed.

Some of the issues that were discussed were:

- Urban encroachment – much like previous farms, Kevin Bayley is facing issues with urban encroachment, which is impacting his farm’s ability to operate.
- Frost – Kevin discussed the issues with frost that he deals with on a yearly basis. To deal with frost, Kevin is resorted to hire a helicopter (at a cost of between \$50k and \$100k per day) and use it to propel hot air from nearby controlled burnoffs to push hot air down and prevent frost on his fruit – this hopefully stops his produce from getting damaged from frost, and if he is able to stay ahead of the curve from his competitors, then the investment is worth it in the end. Kevin also has multiple windmills operating in his fields to push hot air down on his produce to keep the air warm and to prevent frost.
- Water – the Hawke’s Bay area has a lot of bore water available for local growers, which often does not even need to be pumped out given the pressure of the water coming out of the ground. As a result of this, cost and availability of water is not as big an issue with growers in this region as it is in Australia.
- Traceability – Kevin demonstrated his online farm operating system, which included his traceability system as well as employment records for his workers, and record systems that cover every aspect of his business.

Given the short notice to organise a visit, Kevin and his farm manager Abe were both very generous with the growers on the tour.



Kevin demonstrating his farm’s online farming and traceability system.



Abe showing the group some of Bayley Produce’s fields.



One of the many windmills at Bayley Produce used to combat frost.

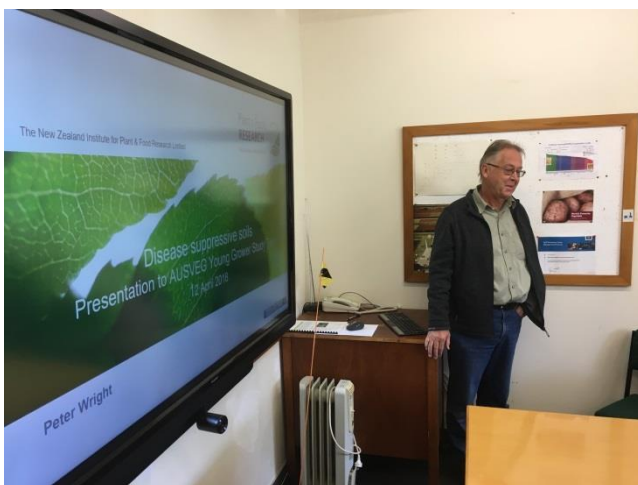
Following this tour the group travelled by bus to Taupo for the night before an early start the next day to Pukekohe.

Day 4: Thursday 12 April 2018

Pukekohe

The group started early to travel by bus to Pukekohe for a full day of visits to Plant & Food Research New Zealand and some vegetable growing operations.

The day started with a presentation from Peter Wright from Plant & Food Research New Zealand to discuss a Hort Innovation-funded project into disease suppressive soils. Peter provided a detailed presentation to the group, who were interested in the way that naturally-suppressive soils could be so beneficial in dealing with damaging diseases.



Peter discussing his research with the group.

The first farm that the group visited during the day was A.S. Wilcox & Sons, one of the biggest potato, carrot and onion growing operations in New Zealand. The group was provided with a presentation from John Wilcox, Sales Manager (Domestic – Supermarkets), who also provided an overview of the company, its products and its various growing regions.

John provided a comprehensive tour of the packing and coolstore facilities of the farm, which was considerably bigger than any of the previous farms visited on the tour.

Some of the areas of discussion included:

- Weather – given the skinny shape of New Zealand’s North Island, the weather is much more variable than it is in Australia, with the weather changing over a short distance from coast-to-coast. This creates problems for planting and harvesting planning as the variability could mean that product (particularly potatoes, carrots and onions) need to stay in the ground longer. To combat this, Wilcox grows in multiple areas in the country so that it can take advantage of the region’s specific climates to supply local and international buyers 12 months a year.
- Urban encroachment – Auckland is one of the world’s fastest growing cities, with housing pressure pushing residents south into Pukekohe. This causes a number of issues, including managing relationships with neighbours who may not know the realities of living near a farm, such as the use of chemicals and the noise of farm machinery and increased traffic for people travelling to and from Auckland for their daily commutes.
- Direct to consumer – Wilcox is focused on providing consumers with the best experience possible with their product, so it works hard to not only supply the consumer directly through unique packaged products, but also using customer focus groups to identify consumer trends and predict new products that will work in the market. From this research, it has developed multiple products that have been tremendously successful, including snacking carrot varieties, potato packs that include ‘windows’ for consumers to look at the product before they purchase, and trialing different potato varieties for consumers.
- Innovation and technology – Wilcox knows that the threat of imports makes it harder to compete on cost from cheaper imported products, but it can compete on quality. To ensure that quality is maintained, it is necessary to research the latest technologies and production practices that can ensure high quality. Examples of these seen on the tour include automatic onion peelers and convenient packaging.
- Food safety and forward planning – food safety is of utmost importance for the company, and in anticipation of future regulation that may require food producers to maintain similar food safety and preparation processes to food service companies to be able to handle and manage food production, it has remodelled its shed to accommodate it, including repaving its concrete floor to be a single slab (around 200 trucks worth of compacted concrete). Employee and fire safety is also a key focus, with the floor completely cleaned at the end of each day.
- Machine maintenance – making sure machinery is serviced regularly is a focus for the company, which employs 11 engineers and two mechanics amongst its 200 equivalent full time employees. Not only are all farm machines regularly serviced, but also its sorting and processing equipment, with one machine taken out of action every week and given a complete service and clean.
- Concentration on people development and transparency – Wilcox has a big focus on developing its staff – as John said, “Its biggest asset is its people”. The company invests in its staff and makes it a priority to ensure its staff are engaged and provided ample development opportunities. The company is also very transparent with its own operations, guided by the mindset that the key to the company’s success is not what it does, but the people who do it.



Processing and packing facility at A. S. Wilcox & Sons.



John discussing some of the company’s potato products.



Pre-peeled onions prepared using an automated peeler.



Beta Bites carrot products for convenient snacks.

The next visit for the group was Sutherland Produce, which grows broccoli, lettuce, silverbeet and other leafy vegetable varieties. The group was provided an overview of the business and some of the production fields and nursery by Sutherland Produce Compliance Manager Kylie Faulkner.

Some of the areas of discussion included:

- Business structure – the business is 50 per cent owned by LeaderBrand, one of the country's biggest vegetable growing businesses, which has provided many opportunities to expand their business. As a result, Sutherland Produce has a governance structure that comprises a company board with two Sutherland-appointed members and two LeaderBrand-appointed members.
- Pest issues – Sutherland Produce constantly battles with many farm pests that impact on the quality of their product; these pests include ducks, native and introduced birds and rabbits.
- Grow seed using nursery – Sutherland Produce grows its own seed in its own nursery, which helps ensure the quality and quantity of its seed stock. It does not supply seed to any other farms.
- Land swapping – Sutherland Produce swaps its fields with other growing businesses that do not grow similar commodities (including A.S. Wilcox & Sons) in a mutually-beneficial relationship that ensures good crop rotations and results in fields that would otherwise be left empty for a season being productive. This practice is not common in Australia but would be an economically-beneficial way of increasing the productivity of land while ensuring good crop rotations. Given it is a mutually-beneficial relationship, having a good relationship with the other business and ensuring they are maintaining the land to a high standard would be a necessity for this to work in the long-run for both parties.
- Integrated Pest Management – Sutherland Produce uses Integrated Pest Management (IPM) as a way to combat pest and disease in their fields. By introducing beneficial insects that target problem pests, it is able to reduce its use of pesticides and as a result reduce costs and improve the sustainability of its land.
- Value-added products – Kylie discussed one of the innovative value-added products in partnership with LeaderBrand. The stalks from its broccoli that would be left in the field after harvest are cut and sent to LeaderBrand's operations in Gisborne and used to make a broccoli coleslaw, or 'broccoslaw', which is targeted at health-conscious consumers. LeaderBrand's website even has a recipe for a chocolate broccoslaw cake.
- Shed technology – Kylie provided a tour of Sutherland Produce's coolstore and packaging facilities to the group, which included an overview of its vacuum cooler (one of only two in New Zealand – the other belonging to LeaderBrand). This machine can cool four pallets of produce at a time to the appropriate coolroom temperature (around 4 degrees Celsius) in 15-17 minutes, which helps ensure its freshness and extends its shelf life.

- Traceability – each packaged product from Sutherland Produce has its own unique traceability code that can track the product to the field it was grown and the date that it was planted, harvested and packaged. Kylie spoke of an incident with a customer complaint about the low quality of the product, which Sutherland Produce was able to track using this code to find the source of the issue: due to poor stock rotation by a retailer it was sold too late to provide optimum quality. This ability to trace individual packs helped to demonstrate the farm was not at fault for the diminished quality of the product, and further discussions with the retailer ensued. This was an excellent example of the value that investing in traceability can have in protecting a grower’s reputation and their business as a whole.



Tour participants inspecting a recently-harvested lettuce crop.



Tour participants inspecting a recently-harvested broccoli crop.



Kylie and tour participants discussing farm issues in a silverbeet crop.



Sutherland Produce’s vacuum cooler – one of only two in New Zealand.



Example of Sutherland Produce’s traceability code on a lettuce product.

Day 5 and 6: Friday 13 and Saturday 14 April 2018

Market visits and travel

The group visited multiple retailers and markets in Auckland during the next two days to investigate the way that New Zealand retailers promote, display and sell their fresh produce and to identify similarities and differences in the way this happens in New Zealand compared with Australia. The retailers that were visited included New World (two CBD locations) and Countdown, as well as two farmers’ markets. Some observations that were made during these visits included:

- Organic produce is more prominent in New Zealand retail stores and not separated into a different section as it normally is in Australia. Organic produce commands a higher price than conventional produce, but has a higher market share when compared to the Australian market. Some organic products also used some type of packaging that reflects its ‘organic-ness’, such as paper bags.
- Given the small size of New Zealand in comparison to Australia, it is less able to grow fresh produce for 12 months a year; therefore, not only does it rely on more imported fresh produce, but it also promotes the seasonality of its local products during the months that it does supply the domestic market. This is also noticeable in its food service industry, which promotes the New Zealand-grown produce prominently in restaurants and cafes. An example of this is scallops, which are only available for one to two months per year and are not exported, meaning that during New Zealand scallop season, they are heavily promoted to local residents and only eaten by local consumers during this window.
- There were multiple examples of value-added products available in New Zealand supermarkets, which commanded a higher retail price. These included: snacking vegetable products such as snacking and baby carrots and cucumbers; pre-peeled red onions (not brown onions, which were trialled but as the flesh is white, consumers did not know what it was or how to use it for their cooking as they thought it was a white onion); and pre-made soup products that promoted the locality of their ingredients and highlighted the fresh produce that was used to create the product (an example is the Hawke’s Bay Cauliflower and Leek soup, which features an image of a fresh cauliflower on its product).
- Traceability information on packaging is prominent on all packaged fresh produce products in New Zealand retailers.
- There was a higher number of potato varieties on display and more packaged potato products than is normally available in Australia (these were mainly A.S. Wilcox & Sons products).
- There were a number of examples of highly innovative packaging that were designed for convenience and extending the shelf life of products. These included:
 - Zip lock bags that contained coriander, which were designed to retain freshness and allow the product to breathe
 - ‘Pack your own tomatoes’ – empty plastic containers that allow consumers to pack their own cherry/baby tomatoes, which allows consumers to customise their tomato purchases
 - Vacuum-sealed products that contain cooked corn on a cob and beetroot
- There was a noticeable difference in the quality of some fresh products in the retail stores when compared to their competitors or through fresh produce markets.
- Countdown promoted its “5+ a day” fruit and vegetable consumption campaign in an effort to increase consumption of fresh fruit and vegetables.



Zip-lock bag of herbs in New Zealand retailer.



Lotatoes Potatoes low carb potato product.



Pack your own cherry tomato box at New Zealand retailer.



Example of product highlighting provenance of New Zealand food products.



An example of the different potato products on offer at a New Zealand retailer.



Participants inspecting vegetable products at a local farmers’ market.

On Saturday 14 April the group travelled from Auckland to Los Angeles for the second week of the mission.

Day 7: Sunday 15 April 2018

Rest day

Day 8: Monday 16 April 2018

Riverside

The day started with the group visiting leading irrigation company Toro’s Riverside facilities for an overview of the company and a tour. The group was provided a presentation and tour from Toro National Accounts Manager Paul McFadden and Director of Marketing Ralf San Jose. The tour included the agriculture product display, which provided information on the company’s drip tape irrigation product and its other agriculture irrigation products, as well as its golf irrigation facilities and its lighting sector (Unique Lighting Systems).

The group found the tour particularly interesting, as many of the participants did not use drip irrigation in their business and were able to enquire about the practicalities and cost of using the technology, which would also reduce water waste and potentially save costs.



Paul discussing Toro’s agricultural products to tour participants.

Due to commercial in confidence technologies on display photos were not permitted inside the premises after the initial presentation.

The group travelled by bus from Riverside to Bakersfield for the evening.

Day 9: Tuesday 17 April 2018

Bakersfield

The group visited two of the largest vegetable farms in California – Bolthouse Farms and Grimmway Farms, which both produce carrots for the American and international market.

Bolthouse Farms

The group was provided a tour of one of Bolthouse Farms’ many carrot fields by Aaron Maby, Bolthouse Farms Senior Manager of Grower Services, who spent time with the group to provide an overview of the American carrot market and the production processes that Bolthouse Farms uses for its products. Some areas of discussion included:

- Overview of the company – Bolthouse Farms employs around 2,000 workers and operates 24 hours a day seven days a week. It grows in six separate growing regions across California, from Salinas to the Mexican border, to ensure year-round supply of carrots. It produces carrots for most major retailers across the U.S. and its products include loose carrots as well as value-added products such as baby carrots, juices and salad packs. The Bakersfield region is a major producer of carrots, with 85 per cent of American carrots coming from the region.
- Less than one per cent waste – Bolthouse Farms is able to have less than one per cent of its carrots wasted through the incorporation of value-added products to its product range. This ensures that the company is able to get some return from its second-grade produce and is able to provide a wide variety of different products to the market.
- Bolthouse Farms works with other growers in the regions to ensure their fields get the appropriate crop rotation, leasing their farms with their neighbours for them to use while providing a benefit back to Bolthouse Farms. This is particularly important for Bolthouse Farms given it is a single-crop business.
- One of the biggest issues facing the company is water availability and the severe Californian drought, which impacts on its ability to grow other crops and increases cost of producing carrots. This is a common issue with Californian growers, as it was with the group of Australian growers on the tour.
- For the salad carrot variety on which the field demonstration took place, the planting density was 120

plants per square foot, which was very dense compared with what the growers on the tour are familiar with.

Unfortunately we were unable to have a tour of the Bolthouse Farms processing facilities.



Tour participants inspecting Bolthouse Farms salad carrots.



Tour participants inspecting Bolthouse Farms salad carrots.

Grimmway Farms

The group was provided a tour of one of Grimmway Farms’ packing facilities by one of the facility’s managers Ramone, who showed the group the facilities and provided an overview of the company. Ramone had been with Grimmway Farms for over 40 years, which showed the dedication that the company shows to its employees. Some areas of discussion included:

- Grimmway Farms is one of the biggest vegetable growing businesses in the U.S. and among the biggest carrot producers in the world, employing around 10,000 workers and the facility the group toured sending 50 trucks of carrots to market every day, with each truck containing 25 tonnes of carrots.
- The company produces both conventional and organic carrots. In preparation for working with organic carrots, the packing facilities undergo a complete wash the night before to ensure that all machinery is adequately cleaned before organic produced is processed. The company produces a wide variety of carrot products, including loose carrots of many different varieties and colours, as well as baby carrots, juices and other value-added products.
- Not as technologically-advanced as other vegetable producers – a lot of the bagging work is undertaken manually by workers rather than by machine; given labour is relatively cheap in California, there is not the necessity to automate its processes as much as other places around the world. The company is beginning

to update its machinery to increase automation of its processes, which will save money in the long-term.

- Underground water cooling process – the facility uses an underground water channel to cool and wash its carrots. Trucks unload carrots from the field into bins, which are then transported through this channel wash and cool them before they undergo processing and packaging. It also does not shut off its cooling processes as it is more cost effective to keep them running with no product than to start them up when they are processing product.
- Grimmway Farms has more farm waste than Bolthouse Farms, but the sheer volume of carrots it processes means that it can afford to have more waste, which often ends up as feed, which is a more sustainable method of utilising waste.

Photos were not permitted in the packing facilities.

Day 10: Wednesday 18 April 2018

Salinas

The group travelled early by bus from Bakersfield to Salinas, the salad bowl of America. The group stopped at King City on the way to Rio Farms and King City Nursery for a tour of its facilities.

Rio Farms/King City Nursery

The group was provided a tour of some of Rio Farms’ production fields by Onion Production Manager Laurie, who showed the group various production sites, including parsley, romaine lettuce, iceberg lettuce and onions. Some areas of discussion included:

- Parsley harvest – the group witnessed some parsley being harvested by hand with around a dozen workers harvesting for the order. The company can have orders that total around 2,500 boxes per day, and it takes around 30 days for the parsley to be at the right level to cut, with each plant capable of about eight harvests.
- The group witnessed hand harvesting of lettuce out in the field. There were some notable insights that were drawn from discussions and observations of the harvesting, including:
 - The product was harvested by workers who were employed by the buyer and not the farm, meaning each buyer sends their own workers to harvest their product. The buyers come to the field to inspect the product before it is harvested so that they can see the quality of the product that they are buying before it leaves the ground.
 - The product was harvested and packed in the field, meaning that there was no need to send the product to a packing shed – this saves the company time as the product leaves the farm sooner to make its way to the consumer and saves money as there are fewer staff and less infrastructure to fund.
- There was a big focus from the Rio Farms team on farm safety, food safety and quality assurance – this included requiring visitors who walked on the fields to wear long pants and shirts covering their bodies and hats/hair nets.
- The group made the observation that the fields were impeccably maintained and there were no weeds visible on any of the fields. This was due to the team employed by Rio Farms to hand-pick weeds in all of their fields. This is possible because of the low cost of labour.
- The group witnessed the early stages of onion growing. The field was to have drip irrigation installed 1-2 months after planting as opposed to from the start of planting.
- The group was also provided a tour of King City Nurseries (owned by Rio Farms). This nursery grows seed for its own farm and for other farms, and includes a wide variety of seedlings, including peppers, celery and brassica.



Parsley harvesting at Rio Farms.



Lettuce harvesting and packing in-field.



King City Nurseries.

Tanimura & Antle

The group arrived at Tanimura & Antle and was met by PlantTape Production Development Manager Danielle Vallejo. After having lunch at the Tanimura & Antle café, the group was provided a tour of some of the production fields and facilities of the company, including a demonstration of its [PlantTape technology](#) and other innovations that the company employs in its vegetable production.

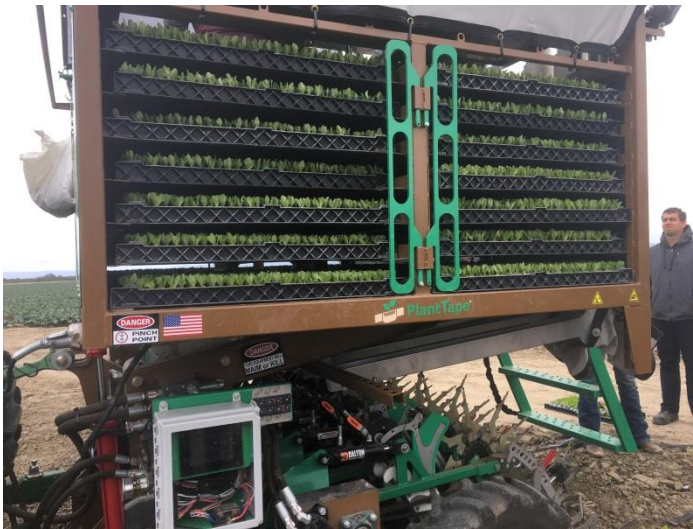
Tanimura & Antle purchased the PlantTape technology from a Spanish company in 2014 and has been developing it and commercialising it in the United States. The technology is not yet present in Australia. The PlantTape system is an automated planting system that aims for increased efficiency and productivity with seedling planting. The seedlings are placed in a tape that is fed through a tractor which can plant the seedling directly into the ground. Its average speed is around 5-6 miles per hour, but can go up to 10 miles per hour, much quicker than other modes of planting. At the time of the tour, PlantTape was commercially used for lettuces, broccoli, cauliflower, celery, onions, tomatoes and cabbage, with some other crops on trial. A video of the technology can be accessed [here](#).

Some areas of discussion during the visit included:

- PlantTape demonstration – the group was provided with a demonstration of the PlantTape planting machine in action, as well as Danielle detailing each part of the machine in detail so that the growers knew what was happening.
- The group witnessed cauliflower harvesting. As was the case at Rio Farms, the produce was harvested, packaged and boxed in the field, saving money with regard to labour and infrastructure.
- Farmers who grow for Tanimura & Antle have access to pooled resources in chemical supplies and application to reduce costs.
- The sheer size and scale of the coolhouse was impressive. The coolhouse that we saw (unfortunately we were not able to have a tour of the facility) was transporting 1 million boxes of produce per week and operated 24 hours a day. The café where the group had lunch was built for the high number of drivers that visit the facility every day.
- The group witnessed an automated weeding machine operating in one of Tanimura & Antle’s fields. The machine, called Robovater, works by differentiating the size of the plant in the row, and automatically and mechanically removing the smaller-sized weed. This is particularly effective when paired with the PlantTape technology, as the seedlings that are planted in the ground are usually taller than weeds when first planted, so the weeder is less likely to accidentally remove the plants rather than the weeds.
- Tanimura & Antle has made a considerable investment in housing and other services for its workers as a result of the housing affordability and accessibility issues in Salinas. The company has spent over US\$17 million to create a housing complex for around 800 workers, keeping the costs of rent and other facilities down as low as it can to ensure their workers are able to save money. Aside from 3-4 bedroom apartments (which are also able to house workers’ families if they pay for the additional family members to stay), there is a shop, laundry facilities, recreational areas and sporting fields that are available for workers, along with a bustling social community that engages staff within the workplace culture.



Danielle showcasing the PlantTape seedling tape.



PlantTape automated planter.



Danielle demonstrating the PlantTape harvester to tour participants.



Example of how the seedlings look post-planting on the PlantTape planter.



Harvesting and packaging of cauliflower in the field at Tanimura & Antle.



Example of housing for workers at Tanimura & Antle’s Salinas site.

Following the visit to Tanimura & Antle, the group was provided with a presentation from Nathan Dorn from Food Origin, an agtech startup that uses data to help farmers make more informed business decisions. Nathan provided an overview of his business and the Western Growers Centre for Innovation and Technology, which represents local and regional family farmers growing conventional and organic fruits, vegetables and tree nuts in Arizona, California, Colorado and New Mexico. Its members are responsible for around 50 per cent of fresh food production in the United States.

Nathan described how the centre was developed as a hub for innovation and new technology in agriculture, in order to achieve Western Growers’ goal of increasing productivity and reducing costs. The centre has connected with more than 50 qualified startup companies that have developed innovative agtech solutions can meet the demands and challenges of growers, shippers and fresh food processors.



Nathan talking to tour participants about potential of agtech startups to assist primary producers.

Day 11: Thursday 19 April 2018

Sacramento

The group travelled by bus to Woodland, just outside of Sacramento, for a tour of Monsanto’s Woodland research facilities. The group was hosted by Charissa Vonk from Monsanto’s Vegetable Research and Development Team, provided a tour of the facilities by Sean MacEachern, Monsanto Statistics and Digital Innovations Lead and heard from multiple other Monsanto researchers and staff members.

The group was provided an overview of the company by Yossi Shapiro, Global Large Seed, Root & Bulb, Brassica Breeding Lead, who discussed the wide breadth of research and technologies that were being used by the company to improve its seed breeding capabilities. The group was also provided a tour of:

- The organisation’s Pathology Lab, where the group was presented with some examples of seedlings and plants that were infected with diseases and those that were being bred to be disease-resistant;
- The Markers Lab, where scientists were tracking genetic markers to identify and isolate genes for disease resistance and other desirable traits; and
- Seed Quality Assurance Lab, where Monsanto researchers test the quality of its seeds.



Yossi providing an overview of Monsanto to tour participants.

The group was highly impressed with the amount of research and quality assurance that was undertaken at the facility. Unfortunately, photographs were not permitted during the tour.

Day 12: Friday 20 April 2018

Sacramento

The group visited the global headquarters of Bayer Crop Science to Bayer Biologics, which is dedicated to innovative biological pest management solutions. The facility spans over 170,000 square feet and is dedicated to R&D activities in vegetable seed and biologics.

The group was hosted by Bayer Project and Product Support Lead, Disease Management, Biologics R&D Sarah Hovinga, who provided an overview of the biologics sector of the business and the biological products on offer, noting that market drivers favour biological products, as pests are unlikely to become as resistant to biologics.

According to Bayer, biologics consist of microorganisms such as bacteria and fungi; beneficial macroorganisms such as predatory mites; semiochemicals such as pheromones; or natural compounds such as plant extracts.

The group was provided with a case study of Bayer’s biological product, Serenade® Prime, which is a fungicide/bactericide with more than 40 registrations worldwide. The product is developed from the beneficial bacteria species *Bacillus subtilis* and the highly active strain QST 713. After germination, these beneficial bacteria live on plant root surfaces and in the soil around the plant root systems (rhizosphere). When the plants and beneficial bacteria are functioning in harmony in the rhizosphere, this leads to an improved root system in the plant and more efficient nutrient uptake. The product can also work well with other crop protection products.

Following the presentation, the group toured the biologics laboratory to learn about how Bayer develops its biological products, how it stores the biological agents and how it mass-produces the biological agents for its products.

Following the tour, participants had lunch with a group of Bayer scientists to discuss their key on-farm challenges and areas where crop chemistry can assist the Australian vegetable industry.

Photographs were not permitted during the tour.

Day 13: Saturday 21 April 2018

San Francisco – Travel Day

The group had a free morning and afternoon in San Francisco before travelling home in the evening.

Outputs

Since the completion of the mission, AUSVEG has encouraged participants to share information on what they have learnt and experienced with their colleagues and 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 Hort Connections 2018. Some participants from the mission were able to attend the convention, which provided access a diverse portion of the horticulture industry in one place and, in doing so, facilitated the opportunity for participants to engage with colleagues and share their knowledge and experiences.

Following the conclusion of the mission, AUSVEG published a news item, ‘Young veg growers learn about NZ and US industries on study tour’ and online photo gallery in the [Weekly Update e-newsletter](#) published on 1 May 2018, which is distributed to approximately 3,100 industry members.

AUSVEG will also publish an article on the tour in an upcoming edition of *Vegetables Australia*, the most widely distributed publication in Australian horticulture, as it is received by approximately 5,500 industry members.

Where the opportunity arises, participants will continue to 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.

Outcomes

The 2018 Young Grower Industry Leadership and Development Mission provided eleven young Australian vegetable industry members with exposure to the latest in vegetable and horticulture production practices and technologies employed by their international counterparts in the U.S.A. and New Zealand. The mission inspired participants to review the strategic direction of their businesses and investigate improvements in their current vegetable growing operations, while simultaneously identifying new ideas and technologies for implementation in Australia. As emerging leaders in their own businesses and the wider industry, the mission facilitated the opportunity for participants to learn skills and knowledge to broaden their leadership capabilities and provided them with more confidence to take up leadership positions in the future to play a direct role in advancing the future of the Australian vegetable industry.

Knowledge was obtained by visiting a range of vegetable and horticulture growing operations, research facilities and agribusinesses across the North Island of New Zealand and California. 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 participants to further research these opportunities upon their return.

Some key findings included the potential of automated harvesting and planting (demonstration of the PlantTape technology was a highlight), using more biological additives at planting and building organic matter within the soil, issues with cost and availability of labour in both countries, different methods of preventing pests, diseases and other potential threats to crops (i.e. frost), irrigation, increasing efficiency and the importance of understanding the consumer and being able to provide them with a desirable and consistently high quality product. The participants also noted the increasing importance of organics in New Zealand and the United States.

As many participants only grow a select number of product lines, they had not been exposed to production practices for different vegetable and horticultural commodities prior to the mission. As a result, the mission allowed participants to expand their knowledge on the different production practices and the challenges faced by other growers in the horticulture sector. Many participants were appreciative of the diversity and variety of meetings as it allowed them to broaden their horizons on potential methods that can be applied to different farming systems.

Throughout the two countries visited, it became clear that the scale of vegetable production in New Zealand and Australia was different than in the United States, which far outweighed both countries. This gave participants a greater appreciation of how their colleagues in America manage production on a larger scale, including the advantages of a steady and relatively cheap source of labour and the technologies and innovations that have been implemented to achieve this feat. It also provided ideas of how participants from smaller growing operations could up-scale and become a market leader in their sector.

The two-week mission also highlighted the important role that research, agtech 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 costs but will also ensure their operations remain as efficient as possible and reduce the possibility of human error and contaminants infiltrating crops. Many growers identified new technologies, such as PlantTape, the Autoweeder, in-field harvesters and biological crop protection as promising solutions for implementation in the Australian vegetable industry.

During the mission, many participants came across innovative ways to value-add or create an off-farm income and noted the importance of diversifying to remain profitable as a business. In addition, the visits to supermarkets and fresh food retail stores highlighted the creativity that some New Zealand and American growers have used to design packaging that is highly appealing to the consumer and meets a unique consumer need. 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.

Importantly, the mission also allowed participants to expand their local and international business networks and discuss mutual areas of interest. The group consisted of a diverse range of participants representing growers and processors across multiple Australian states and they each held a different role within their respective businesses, from business owners with whole-of-farm responsibility to agronomy, and marketing / new product development. This allowed participants to share and discuss their diverse range of knowledge and experience and ultimately learn from each other over the two-week mission.

The group met many influential growers in New Zealand and the United States horticulture industries throughout the mission and was able to forge key contacts. While the technicalities of horticulture may differ from country to country, many of the overarching challenges and issues – including labour, water access, sustainability, profitability

and increasing vegetable consumption – remain the same. The participants relished the opportunity to discuss common issues with international growers and find out the strategies they have implemented to overcome these challenges, and how they could improve areas of their own farms. The participants were very appreciative of the time that these growers dedicated to the visit, their hospitality and transparency in discussing challenges and solutions within their growing operation.

Providing networking opportunities for Australian growers is essential to ensuring that the Australian vegetable industry can prosper into the future. Many participants noted that their attendance on the mission allowed them access to many farms and businesses that they would be unlikely to see on an individual level. It allowed participants to gain a stronger understanding of how the vegetable industry is progressing and how consumer demand is being acknowledged and met.

It is expected that the participants will continue to share their acquired knowledge of New Zealand and American vegetable production processes and developments with their colleagues in the Australian industry. Some participants were also required to present findings back to their company upon their return.

Finally, it is important that participants remain in contact with each other as well as their international 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 – this is particularly important for young growers as the networks they forge as they start in the industry will stand them in good stead for the decades to come.

As a result of levy investment, participants gained a better understanding of the ways they can improve on-farm practices and develop their skills, and were inspired with new innovations and ideas to advance and grow the vegetable industry. This reflects a selection of the outcomes identified in the Vegetable Strategic Investment Plan 2017-21.

Monitoring and evaluation

For monitoring and evaluation purposes, participants were required to share their feedback on the mission during three group dinners. Discussions were also held sporadically throughout the mission.

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.

General comments

- “We visited some very relevant operations but also a few visits to some places that you normally wouldn’t get to go, such as Monsanto, Toro and Bayer. These visits were all very good as it was good to see what happens behind the scenes that most people wouldn’t know.”
- “Great group of young farmers who I will stay in touch with.”
- “I don’t come from a farming background [sales and marketing] ... I learnt a lot during the tour – it was fantastic.”
- “Great learning and networking experience.”
- “The places we visited gave a great insight into vegetable production both in NZ and the US.”
- “The tour proved to be a great tool in meeting like-minded people our age, enthusiastic and passionate about agriculture.”
- “Great tour to give an insight into what our counterparts are doing around the world – bit of an eye opener as to where we sit in relation to the rest of the world.”
- “It has opened my eyes and broadened my horizons.”
- “NZ so different to the US but both had so much to offer.”
- “The tour provided a good overview of growing regions/operations throughout NZ and California.”

New Zealand

- “[Pukekohe] Very good day – some of the larger operations in NZ – really learnt a lot from the visit to A.S. Wilcox & Sons.”
- “Wilcox blew me away at how forward thinking their whole business plan was ... amazing business.”

California

- “Was good to visit Bolthouse and Grimmway as their field in carrots is similar to what I’m involved in at home – their scale was unbelievable!”
- “Saw some very impressive operations and the tours were very well run.”
- “Was interesting to learn that [Bayer] runs a biological division and the potential benefits of this.”
- “Toro’s facility was amazing.”
- “Tanimura & Antle was my favourite stop in the US.”
- “The Salinas valley growing region was a highlight – PlantTape and Autoweeder used by T&A were a good look into the future.”
- “The scale and polish of Bolthouse was mind blowing.”

Recommendations

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

- All Industry Leadership and Development Missions (specifically the United States, European, Women in Horticulture and Young Grower missions) should be combined into one project to streamline reporting requirements and the development of tours.
- Introduce compulsory requirements for participants as conditions of attending the mission to ensure information and learnings from the tour are better disseminated to the wider industry. This can include short, individual presentations to the group on what the participants’ main findings were at the conclusion of the mission (prior to departure), as well as the requirement to contribute to industry communications (magazines, newsletters etc.) and present at one or more industry seminars upon their return to Australia.
- To ensure the mission is beneficial to all parties, include a thorough vetting process for participant selection and ensure the visits organised are well aligned with participants’ backgrounds.
- Incorporate more farm visits with growers in the field, which will hopefully provide some useful information on growing practices.
- Where possible, incorporate more packing shed visits and tours of the farm rather than meetings in a boardroom or discussions with researchers. Growers tend to be more honest and transparent about the problems they face and how they can be fixed, which makes the discussion more realistic for participants.
- Where possible, invite local growers and industry representatives with a broad understanding of the local growing region and key issues to speak to participants on the bus as they travel between meetings.
- Investigate ‘Plan B’ options in case of weather events/other issues make some of the activities unworkable.
- Investigate the potential for more grower input on future grower tour itineraries.

The evaluation form also included a prompt for ideas/technology that would be suitable to submit as a concept to Hort Innovation to be reviewed by the Vegetable Strategic Investment Advisory Panel. Participants’ suggestions are outlined below:

- Commercialisation of the PlantTape technology for Australian vegetable growers.
- The benefits of drip irrigation technology for Australian vegetable farms, including reduction in water use and improved productivity and profitability.
- Continued research into improving soil health and soil restoration.
- Innovation into new vegetable varieties that resonate with local and international consumers.
- Investigate the idea of ‘land-sharing’ between companies that can utilize crop rotations and increase productivity of their soils.
- Direct seeding and mechanical harvesting of processed vegetable varieties.
- Traceability plans and software development.
- Development of biological control options.
- Flow wrapping options for vegetable products.

Refereed scientific publications

None to report.

Intellectual property, commercialisation and confidentiality

No project IP, project outputs, commercialisation or confidentiality issues to report.

Acknowledgements

The 2018 Young Grower Industry Leadership and Development Mission was funded by Hort Innovation using the vegetable research and development levy, contributions from Australian vegetable growing businesses and contributions from the Australian Government.

The mission, including travel, accommodation and meetings, were organised by AUSVEG Ltd.

Thanks must go to all those who gave their valuable time to meet with the delegation, as well as John Seymour from Vegetables New Zealand, Dianne Vesty from the Hawke’s Bay Fruitgrowers’ Association, Peter Wright from Plant and Food Research New Zealand, Jennie Hartwell from Toro and Emily White from Boomaroo Nurseries for their assistance in organising farm visits and stakeholder meetings, without which the mission would have been far less beneficial.

Appendices

Appendix 1: Mission participants

2018 Young Grower Industry Leadership and Development Mission	
Name	Location
Jeremy Adams	VIC
Andrew Smith	VIC
Jamie Alabakis	VIC
Jake Shadbolt	VIC
Patrick Groenewold	TAS
Lachlan Schreurs	VIC
Jake Moon	QLD
Aiden Porter	TAS
Rachel Saliba	NSW
Joshua Armstrong	NSW
Robert Armstrong	TAS
Shaun Lindhe	VIC (Tour Leader)

Appendix 2: Itinerary

Day	Main activities and end location
Day 1 Monday 9 April 2018	Australia – Wellington, New Zealand 09:45: Participants depart Sydney on flight NZ0846 15:00: Participants arrive in Wellington On arrival in Wellington we will be transferred to the hotel before a group welcome dinner and briefing in the evening. <u>Accommodation</u> Bay Plaza Hotel 40-44 Oriental Parade Oriental Bay 6011 Phone: +64 4-385 7799
Day 2 Tuesday 10 April 2018	Wellington – Otaki – Levin – Hawke's Bay, New Zealand 09:00: Check out and depart hotel. We will then travel by coach approximately 1.5 hours to Andrew Yung's farm in Otaki. 10:30 – 11:30: Visit Andrew Yung's farm. Andrew Yung is a long-time member of the New Zealand vegetable industry, specialising in niche product varieties including fennel and Asian vegetable varieties. Andrew is near retirement and will discuss his observations on the changes in the industry and his predictions for the future. 11:30 – 12:00: Travel by coach to Woodhaven Gardens. 12:00 – 13:00: Visit Woodhaven Gardens, a family run commercial growing operation located on the fertile plains of the Horowhenua Region of New Zealand. It has production in excess of 1,000 acres, producing and distributing quality vegetables nationally and internationally. 13:00 – 14:00: Travel to Levin town centre for lunch before travelling to Hawke's Bay. 14:00 – 17:30: Travel by coach to Hawke's Bay, discussing observations and insights from the day's site visits. <u>Accommodation</u> Quest Napier 176 Dickens Street Napier 4110 Phone: +64 6-833 5325
Day 3 Wednesday 11 April 2018	Hawke's Bay – Taupo, New Zealand 09:30 – 10:00: Check out and depart hotel. We will then travel by coach approximately 30 minutes to Lawson

	<p>Organic Farms.</p> <p>10:00 – 12:00: Visit Lawson Organic Farms. Scott Lawson and partner Vicki Meech are committed to growing Bio-Gro certified organic berryfruit and vegetables. They are currently one of the largest producers of certified organic berry fruit and vegetables in New Zealand. Pioneers in their field, they started as a one man band in 1992 and became certified organic in 1994. The True Earth™ brand was launched in 1999.</p> <p>12:00 – 12:15: Travel by coach to Bostock Kitchen and Farm for lunch and a site visit. Bostock houses an organic kitchen that is made with local fresh produce. Each day there is a single meal offered on the menu (recent meals have included 'Spanish Chicken with olives and chorizo, Potatoes and red onions, wilted chards' and 'Pulled pork, salsa Verde, Spelt tartine, apple and cabbage slaw').</p> <p>12:15 – 13:00: Visit Bostock Farm and Kitchen. Bostock New Zealand is one of New Zealand’s leading growers and the largest organic apple producer with a proud history of sustainable growing practices. The company is 100% owned by John Bostock and is based in Hawke’s Bay, one of the cleanest and purest growing environments in the world.</p> <p>The company has been exporting premium produce for more than 30 years – growing and marketing high quality organic apples, squash, onions and grain as well as exporting conventional apples on behalf of independent orchardists.</p> <p>13:00 – 15:00: Visit Bayley Produce.</p> <p>15:00 – 17:00: Travel by coach to Taupo, which sits at the edge of Australasia’s largest lake. Enjoy a free evening.</p> <p><u>Accommodation</u> Suncourt Hotel and Conference Centre 14 Northcote Street Taupo 3330 Phone: +64 7-378 8265</p>
Day 4 Thursday 12 April 2018	<p>Taupo – Pukekohe – Auckland, New Zealand</p> <p>06:30 – 10:00: Check out and depart hotel. We will then travel by coach approximately 3 hours to Plant & Food Research Pukekohe.</p> <p>10:00 – 11:15: Visit Plant & Food Research Pukekohe. The Pukekohe site for Plant & Food Research focuses mainly on potato breeding and production and is one of many Plant & Food Research locations around the</p>

	<p>country. We will be hosted by Plant Pathologist Peter Wright, who is a seasoned researcher across the vegetable sector. Peter will show the group to two major vegetable growers in the region.</p> <p>11:15 – 11:30: Travel by coach to AS Wilcox and Sons.</p> <p>11:30 – 12:30: Visit AS Wilcox and Sons. AS Wilcox and Sons is a major producer of potatoes, onions and other vegetables in Pukekohe. They are highly innovative in their product branding, including the Inca Gold and Piccolos brands of potatoes, the Home Farm brand of onions and the Beta Bites brand of carrots.</p> <p>12:30 – 13:30: Lunch in Pukekohe.</p> <p>13:30 – 13:45: Travel by coach to Sutherland Produce.</p> <p>13:45 – 14:45: Visit Sutherland Produce. Sutherland Produce is one of the largest green vegetable growing operations in New Zealand. The farm is a fourth generation family-based business that grows broccoli, lettuce and silver beet.</p> <p>14:45 – 16:00: Travel by coach to Auckland.</p> <p><u>Accommodation</u> Auckland City Hotel 157 Hobson Street Auckland 1010 Phone: +64 9-925 0777</p>
<p>Day 5 Friday 13 April 2018</p>	<p>Auckland, New Zealand</p> <p>10:00 – 13:00: Enjoy a tour of local markets and retailers and see how food is displayed and sold in the New Zealand market.</p> <p>13:00 – 18:00: Free time in Auckland.</p> <p>18:30: Group dinner to farewell New Zealand and discuss the events over the last four days.</p> <p><u>Accommodation</u> Auckland City Hotel 157 Hobson Street Auckland 1010 Phone: +64 9-925 0777</p>
<p>Day 6 Saturday 14 April 2018</p>	<p>Auckland, New Zealand – Los Angeles, California</p> <p>10:00: Check out of hotel and have a free morning in Auckland.</p> <p>17:45: Meet at Auckland City Hotel where a coach will take the group to Auckland Airport for our flight.</p> <p>21:50: Participants depart Auckland on flight NZ0002</p> <p>15:00 (US TIME): Participants arrive in Los Angeles</p>

	<p>15:30: Travel by coach to hotel. Free afternoon and evening.</p> <p><u>Accommodation</u> Custom Hotel LA 8639 Lincoln Boulevard Los Angeles CA 90045 Phone: +1 310-645-0400</p>
<p>Day 7 Sunday 15 April 2018</p>	<p>Los Angeles, California</p> <p>Free day in Los Angeles to recover from the flight.</p> <p><u>Accommodation</u> Custom Hotel LA 8639 Lincoln Boulevard Los Angeles CA 90045 Phone: +1 310-645-0400</p>
<p>Day 8 Monday 16 April 2018</p>	<p>Los Angeles – Bakersfield, California</p> <p>06:30 – 08:20: Check out of hotel and depart by coach to Toro’s facilities in Riverside.</p> <p>08:20 – 11:45: Visit Toro’s Riverside facility. Toro is a world leader in irrigation technologies. The group will be treated to a presentation from Toro’s Agriculture Irrigation group, which will be followed by an engineering tour of the facilities.</p> <p>11:45 – 15:30: Travel by coach to the hotel in Bakersfield.</p> <p>Free time for dinner.</p> <p><u>Accommodation</u> Hotel Rosedale 2400 Camino Del Rio Court Bakersfield CA 93308 Phone: +1 661-327-0681</p>
<p>Day 9 Tuesday 17 April 2018</p>	<p>Bakersfield, California</p> <p>10:00: Depart hotel by coach to Bolthouse Farms.</p> <p>10:30 – 11:30: Visit Bolthouse Farms, one of the leading carrot producers and packers in the United States. They also sell a number of high value product varieties, including juices and other beverages, salad dressings and pre-packaged carrots.</p> <p>11:30 – 12:00: Return to Bakersfield for lunch.</p> <p>13:00 – 14:30: Visit Grimmway Farms. Grimmway Farms is one of the largest growers, producers and shippers of carrots in the world, with a continued commitment to its founding philosophy: provide good value while conducting business with integrity.</p>

	<p>15:00: Return to Bakersfield for the afternoon.</p> <p><u>Accommodation</u> Hotel Rosedale 2400 Camino Del Rio Court Bakersfield CA 93308 Phone: +1 661-327-0681</p>
<p>Day 10 Wednesday 18 April 2018</p>	<p>Bakersfield – Salinas Valley, California</p> <p>06:00 – 09:00: Check out of hotel and depart by coach to Rio Farms and King City Nurseries.</p> <p>09:00 – 12:00: Visit Rio Farms and King City Nurseries, a joint operation that is one of the top 10 largest vegetable producers on the West Coast.</p> <p>12:00 – 13:00: Travel to Tanimura & Antle Produce in Salinas.</p> <p>13:00 – 16:00: Visit Tanimura & Antle Produce to see PlantTape. Originally developed in Spain, PlantTape was acquired by Tanimura & Antle in 2014 for technical development and commercialisation in the United States. The PlantTape automated transplanting system is ideal for agricultural producers aiming for increased efficiency and productivity in their operations. The system is more efficient than conventional transplanting methods using plugs and soil blocks.</p> <p>PlantTape offers a fully integrated system from sowing the tape, to germination and nursery care, to transplanting in the field. PlantTape is commercially used to plant lettuce, broccoli, cauliflower, celery, onion, tomato and cabbage. Other crops are currently on trial.</p> <p>16:00-16:15: Travel by coach to Food Origins</p> <p>16:15 – 17:15: Food Origins is an agri-tech company that utilises a significant amount of data to assist farmers to make business decisions. Its proprietary sensing technology allows it to gather and analyse data in new and disruptive ways. With unprecedented precision, it can trace value from harvest to table, allowing new levels of transparency and traceability.</p> <p>17:15: Travel to hotel for a well-earned rest.</p> <p><u>Accommodation</u> Quality Inn Salinas 144 Kern Street Salinas CA 93905 Phone: +1 831-758-8850</p>
<p>Day 11 Thursday 19 April</p>	<p>Salinas Valley – Sacramento, California</p> <p>10:00 – 14:00: Travel by coach to Monsanto's facilities</p>

2018	<p>in Woodland, near Sacramento, stopping off for lunch along the way.</p> <p>14:00 – 16:00: Visit Monsanto’s vegetable seed research headquarters, where breeders and researchers come together to discover vegetable traits and develop new varieties. The lab at Woodland is the largest of its kind in the world for vegetable seed health testing.</p> <p>16:00: Travel to hotel.</p> <p><u>Accommodation</u> Best Western Plus Sutter House 1100 H Street Sacramento CA 95814 Phone: +1 916-441-1314</p>
<p>Day 12 Friday 20 April 2018</p>	<p>Sacramento – San Francisco, California</p> <p>10:00: Check out and depart hotel by coach to Bayer Biologicals.</p> <p>10:30 – 12:00: Visit Bayer Biologicals for a tour of its facilities, which is heavily focused on the research and discovery of the next biological products. You will also have an opportunity to meet the scientists to discuss the challenges facing your growing operation.</p> <p>12:00 – 14:00: Travel by coach to San Francisco.</p> <p>14:00 – 17:00: After lunch and dropping bags at the hotel, we will go on a walking tour of San Francisco stopping off at supermarkets along the way to again see how fresh produce is marketed to different consumers.</p> <p>18:30: There will be a group farewell dinner tonight.</p> <p><u>Accommodation</u> Cova hotel San Francisco 655 Ellis Street San Francisco CA 94109 Phone: +1 415-771-3000</p>
<p>Day 13 Saturday 21 April 2018</p>	<p>San Francisco, California – Australia</p> <p>18:00: Meet at Cova hotel San Francisco and travel by coach to San Francisco Airport.</p> <p>21:40: Participants depart San Francisco on flight NZ0007.</p>

2018 Women’s Industry Leadership and Development Mission

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Summary

The 2018 Women’s Industry Leadership and Development Mission provided an opportunity for seven female Australian vegetable levy paying growers to participate on a tour of innovative vegetable growing operations, farms and different areas of the supply chain in France, Belgium and The Netherlands. This 13-day mission was funded by Hort Innovation using the vegetable research and development levy, voluntary contributions from vegetable growing operations and contributions from the Australian Government.

The primary objective of the Mission was to provide current and potential female industry leaders with insights into international vegetable trade and growing operations and enable them to gain an in-depth understanding of the processes, procedures and issues faced around the world to provide a different perspective on their own growing operations. Participants obtained knowledge into production and harvesting methods, export development, food safety practices, marketing, issues sourcing labour and using labour hire, and planning practices used. It allowed the growers to compare and contrast the practices and technologies on their own farms with those in the region.

The mission took place from 22 April to 4 May 2018 and took participants through France, Belgium and The Netherlands. At the conclusion of each site visit, in-depth discussions took place, giving participants the chance to compare experiences and offer feedback. Participants were supplied with a tour booklet containing useful information about each of the site visits and which could be used as a diary to take notes.

The mission provided participants the opportunity to visit an array of vegetable growing operations, packaging facilities, distribution centres and markets. The delegates were able to build and develop valuable networks among the various international hosts, as well as have the opportunity to network with each other. The delegation was able to discuss areas of mutual concern with the local growers and compare the similarities and differences in the issues facing each in their respective regions.

The mission also recognised the vital and changing role that women play in the Australian vegetable and wider horticulture industry. The group consisted of a diverse range of participants from across Australia, each holding varying roles within their respective companies. Roles included co-owners, farm managers, marketing and product development, as well as on-farm responsibilities in processing and production. Importantly, this allowed participants to share their diverse and broad range of knowledge and expertise with each other and provided a valuable professional development opportunity for all involved.

Keywords

Industry Leadership and Development; vegetable industry; Europe; France; Belgium; the Netherlands; networking; grower mission; grower tour; European vegetable production; new technology; leafy green production; vegetable research; AUSVEG; Hort Innovation.

Introduction

For many years, Australia’s vegetable growers have benefited from the opportunity to attend international grower tours to key vegetable production regions around the world. These tours have successfully allowed participants to be exposed to the global horticulture industry and meet their peers in different countries to discuss similar challenges and practices, as well as those specific to the region.

The ability to temporarily step away from Australian horticulture and gain a new perspective on the industry has helped to foster innovation in the Australian vegetable industry, as participants have brought back new knowledge and practices to improve the efficiency and profitability of their operations. Upon their return, participants have also shared their findings with their networks and through industry communications, allowing the wider Australian vegetable industry to benefit from the tour.

The key objective of the 2018 Women’s Industry Leadership and Development mission was to provide an opportunity for leading female members of the Australian vegetable industry to gain a fresh insight into new production practices, machinery, technologies and strategies that are currently being used to advance the horticulture industry in Europe and to improve the networks and leadership capabilities of women in the industry.

To ensure participants received the greatest benefit from the mission, the itinerary included visits to growers, agribusinesses and markets/retailers in France, Belgium and The Netherlands. The itinerary was developed to ensure participants were exposed to a range of vegetable crops, as well as other horticultural crops and sectors in the European marketplace.

Meetings were organised to ensure a diverse range of topics were discussed throughout the two-week mission. This included on-farm production practices and innovations, packing house and processing developments, key areas for vegetable research, an agricultural auction house, agtech innovation, seed production and protection and producers of niche vegetable products. In addition, participants also visited fresh produce retail outlets and markets to see how produce is presented to consumers and the value-adding options that growers have created to minimise waste and increase profitability.

Regular debriefings were held throughout the mission to discuss the key insights and highlights from the meetings undertaken. Participants were encouraged to take notes of meetings and completed an evaluation form to provide feedback on the success of the mission.

The 2018 Women’s Industry Leadership and Development Mission was a strategic levy investment under the Hort Innovation Vegetable Fund.

Methodology

A detailed itinerary was provided to the 2018 U.S.A Industry Leadership and Development Mission participants prior to their departure, as well as a hard copy booklet including the mission’s itinerary and participant contact details. Below is a detailed summary of the events and activities that took place during the mission.

Day 1: Saturday 21 April

Today the group travelled from their home states to Paris, France.

Day 2: Sunday 22 April

All participants met at the Dubai International Airport before boarding our flight to Paris, France.

Day 3: Monday 23 April

Today the group headed towards the western part of France to visit Primeale, which is a key vegetable brand of the Agrial agricultural cooperative that operates throughout France.

A presentation was given by Guillaume Hughes where he provided an overall view of the organisation and explained that the structure of the company results in growers becoming shareholders; however, growers who are members of the cooperative rent their own land to farm.

Primeale has a collection and packing sites in a variety of vegetable areas in France, Spain and Portugal ensuring year-round supply of its customers. Primeale markets a range of fresh vegetable mixes that are packed ready to cook for stews and soups. There are 3 division under the Agrial Cooperative – Prim”co, Vert Frais and Terre de France. The three main brand names are Primeale (fresh vegetables) Florette (prepared vegetables) and Crealine (cooked vegetables e.g. soups).

The tour group was fortunate enough to see the sorting of carrots and the packing facilities.

One of the main insights from visiting Primeale is that they do not use irrigation. They also send a majority of their carrots to market with the dirt on and the shelf life is adequate. The feedback from growers was it was beneficial to understand the main horticultural growing regions of France and to understand the collaborative way that growers and workers work together.

It was a great insight to the grower’s opportunities, challenges and market access in France, the supply chain and logistics that keeps the co-operative company profitable to meet consumers’ demands and respond to supply trends.

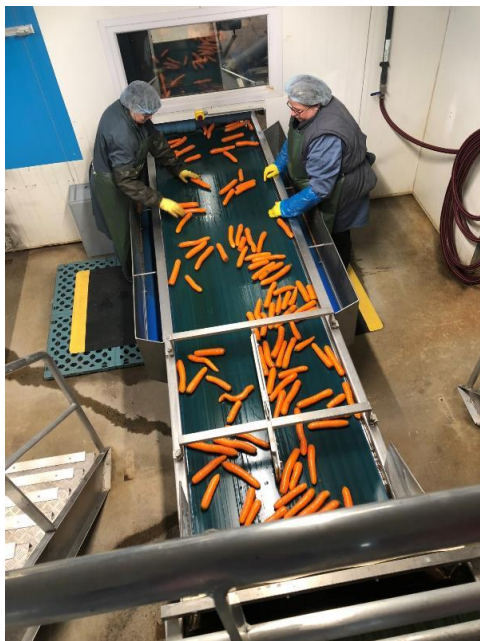
Primeale also face significant labour issues and are forced to recruit workers from Romania, Poland, Hungary and Ukraine.



*Group photo outside Primeale Offices



*Guillaume Hughes, Ligne Directe presenting Primeale to the Group



*Staff sorting carrots

Day 4: Tuesday 24 April

Today the group headed off to see Fresh Market Produce Markets and Supermarkets

Please see below the list and findings:

Monoprix

- Displayed a great variety of fresh produce where you have the option to buy fresh products such as olives and blueberries at 'self-serve bars' that you can dish yourself.
- They had processed food products displayed at the front of the store for convenient, ready-to-use meals.

- Even though they had a great variety of fresh produce there was still an abundance of plastic and bamboo baskets.



*Andrea Hawkes and Jo van Niekerk outside a Monoprix Supermarket



*Vegetable display in Monoprix



*Vegetable/salad display in Monoprix

Le marche d’Alligre’

- This open air market had an amazing arrangement of fresh produce where they were displayed in crates.
- Some of the produce was right in the heat and a lack of cooling was an issue, prices were cheaper compared to Monoprix.
- The promotional theme in the market was “buy today cook today”.



*Fresh fruit and vegetable display in Le marche d’Alligre’



*Mandy Tennant, Natalie Borshoff and Andrea Hawkes at the Le marche d’Alligre’ Market

Le marche’ des Enfants Rouges

- This open air market was one of the oldest in Paris.
- The quality of the produce was average but, being one of the oldest in the city, it had a great reputation and you could immerse yourself in the Parisian culture.
- It also held a great section of pre-prepared food – particularly Moroccan, Japanese and Italian.



*Front entrance of Le marché des Enfants Rouges also known as Little Red Market



*Vegetable display in Le marché des Enfants Rouges



*Vegetable display in Le marche’ des Enfants Rouges

Franprix

This supermarket is quite common throughout the streets of Paris and seemed similar to a 7 Eleven store which was for convenience purchasing of produce.

Le Grand Epicerie

- This supermarket was considered the top end of all Parisian style.
- It displayed an excellent range of fresh produce and had very specific labelling, including country of origin and expiry date.
- This supermarket invested significantly on packaging and displaying produce at its very best.
- In this supermarket you had to buy your bags when you purchase your produce – which is becoming more of an interest in Australia, with changing sentiment towards single-use plastic bags.
- The store was up-market and catered to a higher socio-economic consumer with higher levels of disposable income.



*Vegetable display in Le Grand Epicerie



*Vegetable display in Le Grand Epicerie



*Vegetable display in Le Grand Epicerie

Day 5: Wednesday 25 April

Today the group travelled to the Rungis International Market. The size of the market is enormous, over 234 hectares despite its close proximity to the city, being just 7km from the heart of Paris.

The group was blown away not only by the sheer size of the market but the range of vegetables on offer and the pristine aesthetic quality of the produce on display.

The group was impressed with the scale of the market, with Victorian participants noting that the scale was equitable with the Melbourne Wholesale Market in Epping. Another point of interest was that there were no long-term purchasing agreements in place, replaced with daily purchases. There were also no requirements for Quality Assurance systems to supply the market.

The quality of the produce was good and many vegetable products and varieties were available that are not available in Australia.

Some key stats on the market include:

KEY FIGURES 2016

- €3, 33 billion turnover in the fruit and vegetable sector
- 363 fruit and vegetable businesses
- 1,199,008 tonnes of incoming produce in the fruit and vegetable sector

Fruit and vegetable deliveries - 2016

	Incoming produce 2016 (tonnes)	Variation 2016/2015
Fruits	737 268	+6%
Vegetables	461 739	+2%
TOTAL fruit and vegetables	1 199 008	+4%



*Vegetable display at Rungis International Market



*Vegetable display at Rungis International Market



*Vegetable display at Rungis International Market

After our tour the group met with an importer – Aurelien Fidon, who is the Director of Compagnie Fruitiere, a family owned group since 1939 that mainly grows fruit out of West Africa. The main commodities were bananas, pineapple, mangoes and cherry tomatoes.

Over the course of a year they export 500 tonnes of fruit and they have their own shipping route, supplying five major supermarkets in Asia.



*Aurelien Fidon, General Director talking to the group of growers



*Vegetables stored in the cool room at Compagnie Fruitiere

Day 6: Thursday 26 April

The group departed Paris and headed towards northern France to visit a chicory farm which is part of the BUFL group – a fresh farming co-op model.

There we were shown how the chicory is processed after it is harvested; it was quite an old mechanism but very efficient. While their main crop is chicory, they also have a diverse business model that includes grain and cattle. They also had their own reticulated water sanitiser recycling system.

After processing the group was shown the packing area where they had lines of different labelled boxes with the different size of crop and which were then sent to supermarkets.

All of their waste produce goes to their cattle as feed which were only 100m from the processing shed.

The feedback from growers was wonderful to be on a farm and see the growing techniques, harvesting, processing and packing.



*Local grower chicory farm



*Chicory stored in refrigeration

After visiting the chicory farm we headed off into Belgium where we visited Urban Crop Solutions, which creates fully automated indoor farming systems using LED lighting that are both efficient and effective under any given climate conditions.

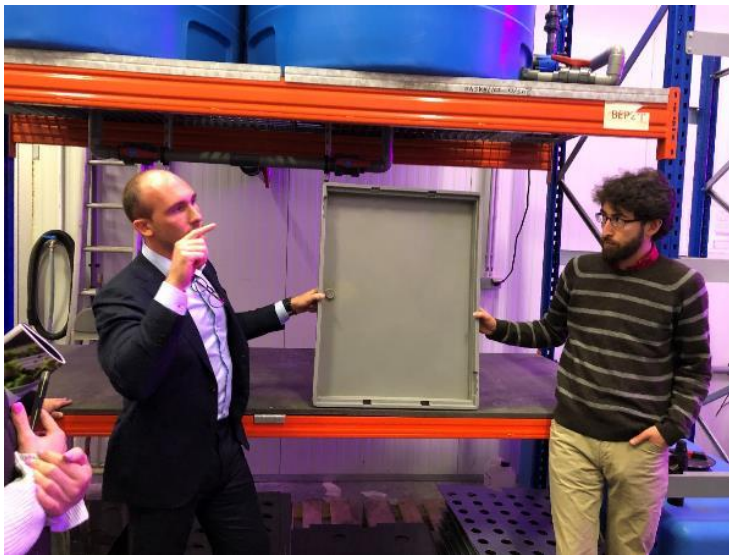
Urban Crop Solutions envisions to become the global independent reference of the fast-emerging vertical farming

industry.

As a company Urban Crop Solutions focuses not only on development and production of these systems, but also on biological & plant technical research to relentlessly improve the Urban Crop Solutions growing systems and to provide customers with the best technology in terms of LEDs, substrates, nutrients and seeds.

The group was presented with a tour from Brecht Stubbe and Nicolas Tsurukawa, who showed the group the company's technologies and the potential for vertical farming to revolutionise the future of global horticulture.

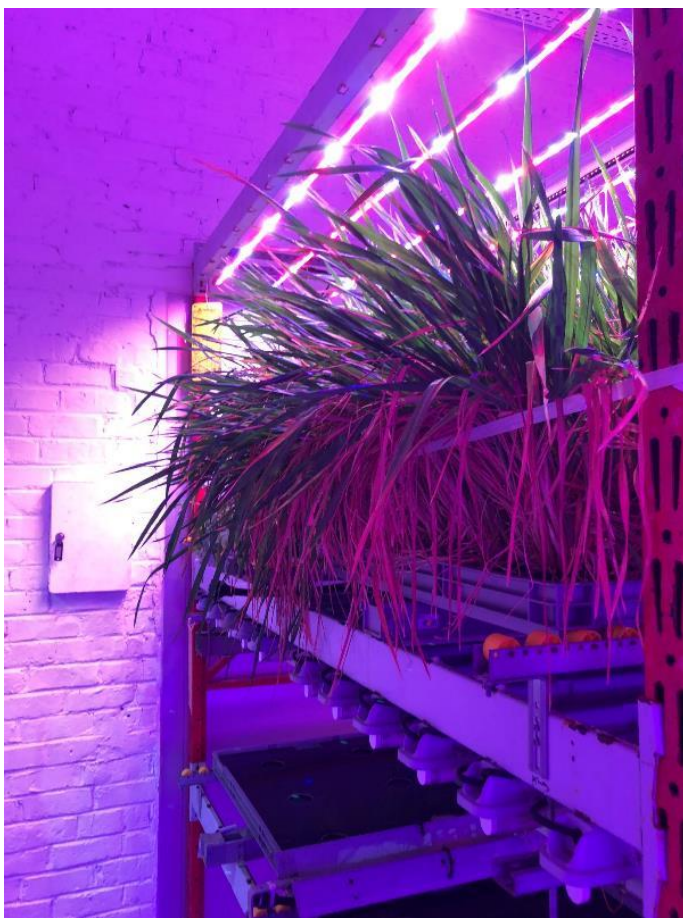
Growers noted that the speed and change of technology in the industry is so advanced that the equipment could quickly become obsolete, so it is important to be informed of the latest technologies that are on offer for growers and the wider supply chain.



*Brecht Stubbe and Nicolas Tsurukawa from Urban Crop Solutions



*LED Lighting at Urban Crop Solutions



*LED Lighting at Urban Crop Solutions

Friday 7: Friday April 27

Today the group travelled to Roselare where we visited REO Auction House.

Dominiek Keersebilck, Commercial Director gave the group an overview of the organisation and the group was lucky enough to have Rita Demare, President of the Auction House, join for a Q&A session with growers at the end of the presentation.

REO has a cooperation with 2,900 shareholders, more than 70 different kinds of vegetables and 142 employees. It emphasised it requires more young growers to the company and keeps the passion of vegetables going forward. Half of its produce is exported while the other half is sold domestically, with climate a big factor in their sales.

REO Auction House sells over 65 different types of fruits and vegetables to clients in Europe, Canada, the US and Asia. It also supplies three main supermarkets and 27 smaller retailers.

Around 200,000 tonnes of fruit and vegetables are delivered to the REO Auction, including common and more niche varieties of both conventional produce and organic. REO Auction checks the products and offers them efficiently to the buyer – the auctioned fruit and vegetables can already be in the shops the day after the harvest.

The auction clock is the most important sales instrument of the REO Auction. The auction clock guarantees transparent and competitive pricing determined by supply and demand.

The group noted that it was a well-organised system where you can bring your produce on a crate to be sold, and then obtain a new and clean crate for the next day's delivery.



*Dominiek Keersebilck showing the group areas in Belgium



*The auction room where the bidding take place of vegetables

After the presentation and tour, the group headed off to a local grower Bert Depoorter, who grows lettuce using a hydroponic system. He showed the group around his facility where his produce is fully automated and he only requires four staff to operate his business.

The growers noted that this operation was very efficient and they were amazed at the size of the block/cell were which was geared to his operation.



*Bert Depoorter and Dominiek Keersebilck outside the greenhouse



*Lettuce display

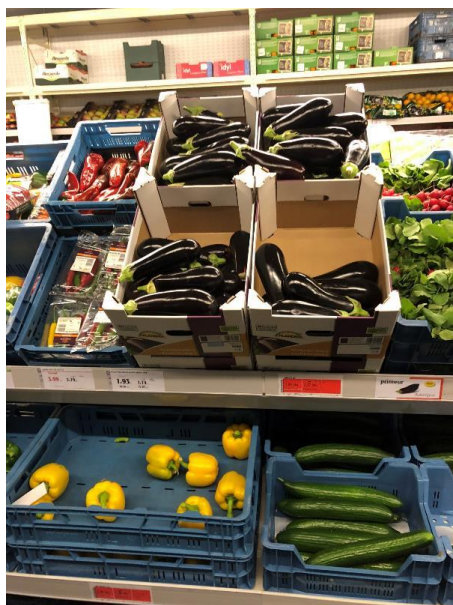
In the afternoon the group visited a local retailer – Colruyt Supermarket. This is a very particular supermarket in the European retail environment, with its fresh produce stocked in a refrigerated area, which is different to most Australian retailers.

The group felt it was a cross between ALDI/Costco where you buy items in bulk and at a discount.

It was messy and cluttered and not customer focused as there was no glass frontage although they did have returnable glass bottle facility for recycling. The retailer was not targeting a higher socio-economic consumer and the group noted the differences in how it displayed and marketed its produce compared with other supermarkets from earlier in the mission.



*Front of Colruyt Supermarket



*Produce display at Colruyt Supermarket



*Produce display at Colruyt Supermarket

Day 8: Saturday 28 April

Rest Day

Day 9: Sunday 29 April

This morning the group travelled from Brussels to Amsterdam – a three hour bus trip.

After arriving in Amsterdam we were met by our local guide Paul Van Gemst, where we ventured on an hour walk to Land Markt.

This market is a fresh produce market in the northern Amsterdam where most of the produce is grown locally. It also has a restaurant where they cook on premises the food that you can buy.

After a walk around the market we found the produce to be fresh and well presented – with not too much packaging compared to the supermarkets visited earlier in the mission.

The growers noted that the market had full track/traceability to the grower and producer of the fresh produce, from vegetables to fruit, dairy, meat and fish.



*Produce display at Land Markt



*Produce display at Land Markt



*Produce display at Land Markt

Day 10: Monday 30 April

Today the group travelled to Barendse DC, the largest capsicum greenhouse in the world. Our energetic tour guide was Tinke Sol who is very passionate about orange capsicums.

The group was shown through the extensive facility, which grows orange and green capsicums. While orange capsicums are not common in Australia, Tinke 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.

A walk through the facility gave the group a clear appreciation of the extensive size of the business. As energy is a very important factor in greenhouse production, Barendse DC has implemented a sustainable method of producing its capsicums, using 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. Tinke 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.

Given the extensive size of the greenhouses, there was a high level of automation and it was great to see a robot in action. 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.

The growers found the facility of massive proportion with passionate growers in a well-tuned family business.

The waste goes to the farmer next door whilst they also donate any odd shaped capsicums that are not fit for market to Food Bank. They also like to employ students to encourage them to get into the horticulture industry.



*Group photo at Barendse DC



*Robot in action



*Display of growing capsicum



*Group photo displaying capsicum

In the afternoon the group visited Syngenta where we were given a tour by Ivar Zwaan.

The group was provided a tour of the facilities and was very impressed with the technology and processes on display, as well as the interactive board that displayed over 100 seeds, inviting guests to test their knowledge and guess which seeds they were.

The presentation included a display of historical photos that showed where the company started and how it got to where it is today.

The growers learnt about Syngenta’s sterilisation of transferred bacteria to coating seeds and its growth trials. They enjoyed the process of seed production and learn the processes undertaken to deliver a high quality product to growers across the world.

Behind a vaulted door is where all the seeds were contained Ivar advised that those seeds are worth more than the Royal Bank of the Netherlands.



*Old entrance to Syngenta



*Processing of seeds

Day 11: Tuesday 1 May

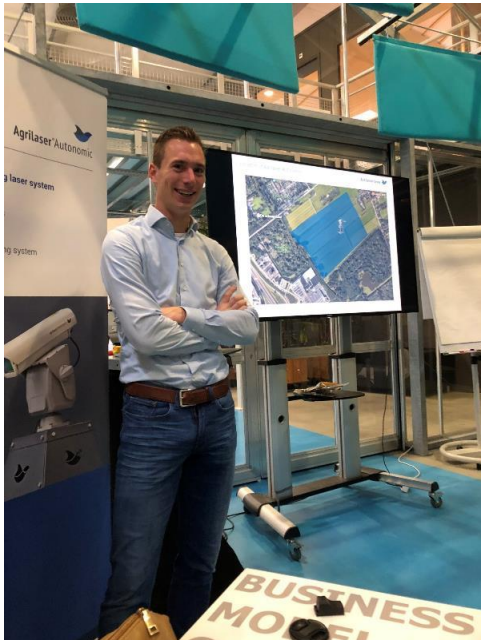
Today we travelled to Delft where we were given a presentation given by Gijs Groen, Area Sales Manager from the Bird Control Group, which produces laser technology as a sustainable, non-lethal method of bird control.

This company started with a bored student who was pointing a laser light at birds, which led to the discovery of a sustainable solution to keep birds at a safe distance from farms.

Gijs provided the group with a presentation that outlined the Bird Control Group's three main products: reactive laser systems, preventative laser systems and reporting and detection systems.

One of the main points of interest to the group was the preventative laser system, which repels birds from known 'bird hotspots'. The laser is an automated system that controls an area of land 24 hours a day, 7 days a week. Gijs outlined that birds perceive the laser beam as a physical object, which appeals to their survival instinct, causing them to fly away. It is a great solution which the birds do not get used to and they are not harmed.

At the conclusion of the presentation the group was taken out in to a field where the preventative laser system was already in place. This technology was of huge interest to the growers, as the ability to control birds and keep them away from crops is an issue faced by many of the growers, particularly down the Victorian coast of the Peninsula, as well as airports and vineyards.



*Gijs Groen from Bird Control Group



*Hand held laser

The next stop for the group was a short drive to Monster to visit Koppert Cress. The group was blown away with the high quality and standard set throughout the entire Koppert Cress facility.

Koppert Cress produces microgreens and has built a brand and marketing campaign that has set it apart as a premium producer. It sells to high-end Michelin star chefs, and has initiated a significant marketing campaign to provide a 'Cressperience' to anyone who visits their operation.

The tour at Koppert Cress, hosted by Tara Vester, began with a tasting session of their cresses. The group tasted an assortment of produce, and was amazed at the amount of flavour which could come out of such a small sample.

After the tasting session Tara took the group on a tour of the facility greenhouse. The group was impressed with the level of automation and the efficient heating and cooling system utilised within the greenhouse. Every step in production at Koppert Cress has been planned and analysed to ensure the produce is a consistent high quality.

The technology was amazing and it is a great family company where staff are provided a healthy lunch every day.



*Group sampling cresses



*Greenhouse displaying cress

Day 12: Wednesday 2 May

Today the group visited Wageningen University, one of the world's leading research institutions for agricultural technology and innovation.

We were given a presentation by Frans Kampers and Erik Toussaint to provide an overview of the university's facilities and research areas.



*Erik Toussaint talking to the group

A link to the presentation provided to the group is below.



wur_corporatepresentation_with video_ul

After the presentation the group was shown around the campus and was very impressed with the gene modification facilities and processes employed by the university to breed desirable traits into plants.

While on the tour we also met Rob van Tol, a Senior Scientist Entomology of the university, who showed the group the laboratory where he conducts his research into cutting-edge experiments on visible insect traps.

Please see below link to the general description of the project:

<https://www.wur.nl/en/project/Are-more-visible-traps-more-effective.htm>



*Rob van Tol discussing his insect trap project to the group

We were then very fortunate to be hosted to a lovely lunch at the Restaurant of the Future where they base the type of food eaten by people's behaviours – what, how, and when they eat.

The restaurant serves the entire university.

After lunch we travelled to De Lier to visit Rijk Zwaan.

Rijk Zwaan was founded in 1992 and is a vegetable breeding company that develops vegetable varieties and sells vegetable seeds for commercial cultivation in glasshouses, tunnels, and outdoors. The company offers eggplants, tomatoes, cucumber, pepper, beetroot and celery, carrots and celeriac, brassicas, endive, corn salads and Swiss chards, lettuces, melons and watermelons, and spinach. It sells its products through locally-operating sales subsidiaries and distributors worldwide.

We were very fortunate to have a presentation made by Anneke van de Kamp – Group Manager Communication and Public Affairs.

The growers were appreciative of having a woman present to the group and were highly impressed with the fact that 30 per cent of the company's profit goes back into research and development. The group also noted that seeds grown in Australia then go to Holland for testing then back to Australia for growing.

After the presentation, the group was shown through the facility by Evelien van der Meer – Specialist Sales Support. The group noted that clean nature of the facilities, which was made more impressive given its expanse.

The group then travelled to Rotterdam where we were hosted to dinner by Jolanda van Kralingen – Specialist Communication, where all the growers engaged in fulfilling conversation especially regarding the programs that we offer in our schools regarding vegetable consumption.



*The group being shown around Rijk Zwaan facility by Evelien van der Meer



*The group being shown around Rijk Zwaan facility

Day 13: Thursday 3 May

Full Rest Day

Some of the group visited two other supermarkets which are listed below:

Albert Heijn

Quite a popular supermarket in the Netherlands quite similar to Coles/Woolworths.



*Albert Heijn Supermarket



*Produce Display at Albert Heijn



*Pre-packaged vegetables and salads at Albert Heijn

Jumbo

Again quite a popular supermarket but they had a section out the front of the supermarket where there were ready-made meals. Many of the locals buy this for convenience shopping as there is no food wastage in this complete meal.



*Produce display at Jumbo Supermarket



*Convenience meal display at Jumbo Supermarket

Day 14: Friday 4 May

Most delegates depart Amsterdam to fly home to their respective cities.

Outputs

A report on the mission’s activities has been prepared for industry and submitted with this milestone report.

Participants each completed an evaluation form that outlined their thoughts on the mission, including feedback from each day of the trip. This will be used to ensure all future missions are effective as possible.

An article will be published in a future edition of Vegetable Australia magazine, which will distribute the learnings and knowledge gained through the mission to the broader industry. The magazine is the most widely distributed magazine in Australian horticulture.

Participants have been encouraged to discuss their learnings with others in the industry to help distribute the learnings from the mission.

Outcomes

The 2018 Women’s Industry Leadership and Development Mission offered participants the opportunity to visit innovative vegetable growing operations, farms and different areas of the supply chain in France, Belgium and The Netherlands, and build strong networks amongst the diverse group of female participants. It connected nine Australian industry leaders with peers, innovative agribusinesses, growing operations and government bodies across Europe, with the mission allowing delegates to expand their leadership capacities while developing a greater understanding of the international horticulture industry.

The range of site visits encompassed growing operations, processing and production facilities, as well as wholesale and large-scale retail markets. Participants shared knowledge and experiences with their counterparts in each country, and were able to develop the skills and confidence required to critically review all aspects of their own business operations.

It was recognised that the mission was a highly rewarding and valuable experience that all eligible Australian growers should be encouraged to attend. The mission also plays a vital role in that it empowers women in the industry by connecting them with business contacts from the international vegetable industry, as well as with each other, to not only strengthens their own respective networks within horticulture but the wider agriculture industry. Mission delegates agreed to promote their experiences and insights gained with their peers, and have emphasised that the mission was an invaluable experience and learning tool.

Providing networking opportunities for Australian growers is essential to ensuring that the Australian vegetable industry can prosper into the future. Many participants noted that their attendance on the mission allowed them access to many farms and businesses that they would be unlikely to see on an individual level. It allowed participants to gain a stronger understanding of how the vegetable industry is progressing and how consumer demand is being acknowledged and met.

It is expected that the participants will continue to share their acquired knowledge of American vegetable production processes and developments with their colleagues in the Australian industry. Some participants are in regular contact with as many as 40 growers from multiple growing regions, which will help to disseminate information from the mission to the wider industry. Some participants were also required to present findings back to their company upon their return.

Finally, it is important that participants remain in contact with each other as well as their American 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.

As a result of levy investment, participants gained a better understanding of the ways they can improve on-farm practices and develop their skills, and were inspired with new innovations and ideas to advance and grow the vegetable industry. This reflects a selection of the outcomes identified in the Vegetable Strategic Investment Plan 2017-21.

Monitoring and evaluation

For monitoring and evaluation purposes, participants were required to share their feedback on the mission during three group dinners. Discussions were also held sporadically throughout the mission.

Participants were asked to share their thoughts and feedback at the end of each day through an evaluation form. These forms can be used to determine the effectiveness of the mission and help to shape future missions throughout Europe. The below quotes provide a sample of the feedback received and have been extracted from the evaluation forms.

- “An amazing journey we had the opportunity to not only learn, see and taste produce from a selection of Europe’s finest”
- A great opportunity for levy paying growers to be able see so much industry”
- “Farm and facility tours were diverse and displayed a great range of farm and technological improvements”
- “Tour was excellent – great group of girls building lasting memories and friendships”
- “We saw a wide spread of industry from seed companies to protected cropping, field grown to processing, innovation in pest control to research”
- “I would have liked to be more in the countryside rather than the city”
- “The tour was well laid out in regards to travel efficiency and the variety of visits”

Recommendations

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

- All Industry Leadership and Development Missions (specifically the United States, European, Women in Horticulture and Young Grower missions) should be combined into one project to streamline reporting requirements and the development of tours.
- Introduce compulsory requirements for participants to attend the mission to ensure information and learnings from the tour are better disseminated to the wider industry. This can include short, individual presentations to the group on what the participants’ main findings were at the conclusion of the mission (prior to departure), as well as the requirement to contribute to industry communications (magazines, newsletters etc.) and present at one or more industry seminars upon their return to Australia.
- To ensure the mission is beneficial to all parties, include a thorough vetting process for participant selection and ensure the visits organised are well aligned with participants’ backgrounds.
- If timing permits, incorporate field days, looking at variety trials in the paddock
- Being able to see how farms harvest different vegetable products.
- More time focused in rural areas and limit the amount of travel time where applicable.
- More visits that focus on innovative technologies, including automated pack houses and manufacturers.
- Incorporate visits in the field, particularly when speaking with other growers.
- Production and processing of different commodities, both vegetables and other horticultural products.

The evaluation form also included a prompt for ideas/technology that would be suitable to submit as a concept to Hort Innovation to be reviewed by the Vegetable Strategic Investment Advisory Panel. Participants’ suggestions are outlined below:

- Development of LED lighting technologies that replicate the environment while also providing a sterile condition to inhibit contamination. Also fully-closed production systems.
- Develop the idea of an REO Auction House-style system that could be replicated in the Australian environment.
- Identify regulations and red-tape that could be removed to make growing vegetables more efficient.
- Duck deterrence and the impact of the use of lasers on native and indigenous wildlife.
- Cooperative models for packaging materials and more environmentally-friendly packaging options.
- Using waste products more productively to increase productivity and increase sustainability.
- One of the participants has obtained contacts from local SIAP members so that they can relay any future ideas to the industry SIAPs.

Refereed scientific publications

None to report.

Intellectual property, commercialisation and confidentiality

No project IP, project outputs, commercialisation or confidentiality issues to report.

Acknowledgements

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Appendices

Appendix 1: Mission participants

Delegate	Company	Position
Carol Knight	AUSVEG	Tour Leader
Alexander Keith	Bulmer Farms	Agronomist
Lisa Brassington	Peninsula Fresh Organics	Quality and Land Management Officer
Andrea Hawkes	Hawkes Vegetables	Packing Shed Manager
Jo Van Niekerk	Boomaroo Nurseries	Victorian Territory Manager
Belinda Adams	Coastal Hydroponics	Manager
Sharron Windolf	Windolf Farms	Part Owner and Financial and Compliance Manager
Mandy Tennant	Muylan Pty Ltd	Manager – Packing Facilities and Quality Assurance
Natalie Borshoff	Firetail Farms	Assistant Manager and Supervisor

Appendix 2: Itinerary

Day	Itinerary
Day 1 Saturday 21 April	Australia – Dubai – Paris, France Depart Australia to Paris on specified flight.
Day 2 Sunday 22 April	Paris, France Arrive Paris - Rest Afternoon
Day 3 Monday 23 April	Paris, France 8:00am – 5:00pm - Primeale Co-op Visit
Day 4 Tuesday 24 April	Paris, France 8:00am – 5:00pm – Fresh Produce Market and retail Stores
Day 5 Wednesday 25 April	Rest Day – Paris, France 7:00am – 10:00am – Rungis International Market 11:00am – Rest Afternoon
Day 6 Thursday 26 April	Paris, France – Brussels, Belgium, 8:00am – 11:00am - Chicory Farm Visit 2:00pm – 4:00pm – Urban Crop Solutions
Day 7 Friday 27th April	Brussels, Belgium 8:00am – 11:00am – REO Auction House 11:00am – 12noon – Colruyt Supermarket
Day 8 Saturday 28 April	Brussels, Belgium - Full Rest Day
Day 9 Sunday 29 April	Brussels, Belgium - Amsterdam, The Netherlands 8:00am – Depart Brussels to Amsterdam 11:00am – 6:00pm – Supermarket and local fresh produce markets
Day 10 Monday 30 April	Amsterdam, The Netherlands 10:00am – 12:30pm – Barendse-DC 2:00pm – 4:30pm – Syngenta Demo Field
Day 11 Tuesday 1 May	Amsterdam - Delft - Monster – Amsterdam, The Netherlands 9:00am – 1:00pm – Bird Control Group 3:30pm – 5:00pm – Koppert Cress
Day 12 Wednesday 2 May	Amsterdam, The Netherlands 9:00am – 11:30am - Wageningen University 3:00pm – 6:00pm Tour Rijk Zwaan Tour

Day 13 Thursday 3 May	Amsterdam, The Netherlands - Full Rest Day
Day 14 Friday 4 May	Amsterdam – Home Home sweet Home!