Final Report

2018 U.S.A Industry Leadership and Development Mission

Project leader:

Shaun Lindhe

Delivery partner:

AUSVEG Pty Ltd

Project code:

VG15702

Project:

2018 U.S.A Industry Leadership and Development Mission – VG15702

Disclaimer:

Funding statement:

This project has been funded by Hort Innovation, using the vegetable research and development levy and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture.

Publishing details:

ISBN 978 0 7341 4436 2

Published and distributed by: Hort Innovation

Level 8
1 Chifley Square
Sydney NSW 2000

Telephone: (02) 8295 2300

www.horticulture.com.au

Content

Summary

The 2018 U.S.A. Industry Leadership and Development Mission provided an opportunity for a group of nine vegetable industry members to visit innovative growing operations, research facilities, agribusinesses and the World Ag Expo in the United States.

From 3-17 February 2018, the group travelled to California and Florida – the two biggest vegetable growing regions in the United States – as well as Arizona, a key vegetable production area in winter.

The two-week tour led by AUSVEG began in Phoenix, Arizona, where the group visited Arnott's Family Farms and Rousseau Farming Company. Participants then travelled to Yuma, a hub of leafy green production during winter. Participants met with Automated Harvesting Company and JV Smith Companies, as well as The Growers Company to gain a better understanding of labour in the United States. The group also had an opportunity to travel across the border to California's Imperial Valley, where they met with Vessey & Company, Oasis Farms and the University of California Desert Research and Extension Centre.

The group then travelled to Florida where they examined the similarities and differences in a range of horticultural crops, providing an opportunity to see how other industries are tackling ongoing challenges. In Florida, participants met with Sizemore Farms, the University of Florida Gulf Coast Research and Extension Centre, Lipman Family Farms, Southern Hill Farms, Wild Goose Farms and Billy Long Packing House.

For the final leg of the mission, the group returned to California. They were given a behind-the-scenes tour of Taylor Farms' salad processing facility and met with startup agtech companies at the Western Growers Centre for Innovation and Technology, as well as the United States Department of Agriculture's Salinas Agriculture Research Station. In Sacramento, participants toured Bayer's Biologics facility and stopped by Ratto Bros. on the way to the World Ag Expo. The group also visited Bolthouse Farms and Grimmway Farms, the two largest carrot producers in the United States.

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 also appeared in *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 on the east and west coasts of America, providing a clearer insight into industry nuances, production practices, new technologies and issues facing growers in the United States. Participants were exposed to farming practices in a range of horticultural crops, as well as the ways that growers in the United States 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.

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. The timing of the mission to the United States can be altered to accommodate summer production, when a more diverse range of vegetable crops are grown. It may also be beneficial for participants to be exposed to the different elements of the supply chain, including processing through to distribution and retail outlets.

Keywords

Industry Leadership and Development; vegetable industry; United States; U.S.A. horticulture; networking; grower mission; grower tour; American vegetable production; new technology; leafy green production; biologicals; vegetable research; Yuma Arizona; Imperial Valley; Florida horticulture; California vegetable production; Salinas Valley; World Ag Expo; 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 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 United States is a key vegetable producer and serves as an excellent example of the ways in which growers are producing and marketing vegetables on a large-scale to meet consumer demand across the country. With this in mind, the key objective of the 2018 U.S.A. Industry Leadership and Development mission was to provide an opportunity for leading 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 the United States.

To ensure participants received the greatest benefit from the mission, the itinerary included visits to California and Florida, the two biggest vegetable producing states in America. Given the timing of the mission (early February), visits to Yuma, Arizona and the Imperial Valley, California were also incorporated as they are key vegetable production areas during winter on the west coast of the United States.

The itinerary was developed to ensure participants were exposed to a range of vegetable crops, as well as other relevant horticultural crops in the United States. This was particularly relevant in Florida, where participants enjoyed the opportunity to see strawberry, blueberry, blackberry and citrus crops and talk to growers about cross-horticultural challenges and opportunities. In Yuma and the Imperial Valley, participants witnessed vegetable crops being harvested and gained a first-hand insight into the machinery and technology used, as well as the different innovations that growers have introduced to boost efficiency and profitability.

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 (both conventional and organic), packing house and processing developments, key areas for vegetable research, labour sourcing programs, agri-tourism initiatives, agtech innovation, biological crop protection and a visit to the world's largest agricultural exhibition, the World Ag Expo. 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.

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 U.S.A. Industry Leadership and Development Mission was a strategic levy investment under the Hort Innovation Vegetable Fund.

2018 U.S.A. Industry Leadership and Development Mission participants with blueberry growers Lisa and David Hill (far right) at Southern Hill Farms in Florida.

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 3 February

Australia – United States: Travel day

Participants travelled from either Brisbane or Melbourne to the United States. After arriving in Phoenix, Arizona, participants attended a welcome dinner where they introduced themselves and were briefed on the mission.

Day 2: Sunday 4 February

Phoenix – Yuma, Arizona: Duncan Family Farms and Rousseau Farming Company

The mission began with a visit to Duncan Family Farms, which produces more than 8,000 acres of certified organic baby lettuce, and green kale, beets, chard and herbs near Phoenix, Arizona. Participants met owner Arnott Duncan, who provided a tour of the operation and discussed his commitment to environmentally-friendly farming practices.

As Arnott has struggled to find high quality compost in the past, he explained how the operation created its own compost blend of nitrogen and carbon in 2013 to maintain a quality product and limit potential food safety issues. Duncan Family Farms has since partnered with local municipalities and businesses to divert around 250,000 tonnes of local green waste that would otherwise go to landfill. Material is delivered to a central location and grinded into smaller portions that can be blended with raw animal manures to produce high quality compost. This year-long process exceeds the legal requirements for compost production in the United States and successfully breaks down complex pesticides that may be present in green waste. The compost is also tested for a range of pathogens including *E.coli*.

Arnott explained that nuisance birds such as pigeons and horned larks also pose a significant threat, as they not only eat the crops but can also shed feathers or defecate in the fields. To combat this issue in a sustainable way, Arnott introduced falconry, which uses a team of trained falcons to intimidate and chase nuisance birds away from the crops without harming them. As the falcons also leave the area to find new hunting ground, they are less likely to kill a prey bird in the field and cause a food safety issue or loss of product.

Arnott Duncan shows participants a field of organic baby leaf lettuce.

The group then met with Albert Jayko and the team from Rousseau Farming Company. Established in 1892, the company now farms 9,000 acres – of which over 70 per cent is dedicated to vegetable production including carrots, broccoli, cabbage, mixed greens, celery, onions and sweet corn – while more than 1,100 acres is dedicated to organic production.

Albert explained that the operation is vertically integrated with its own harvesting equipment, trucking, cooling, icing and shipping facilities, including a carrot packing plant for baby peeled carrots and whole carrots. The majority of produce is distributed locally in Arizona as well as the east coast and Canada, depending on market demands.

Carrots were being harvested at the time of the visit, and participants took advantage of the opportunity to see the harvester in action. The participants who grew carrots in Australia also held discussions with Albert about the finer details of carrot growing.

Following the visit, participants continued on to Yuma.

Carrots harvested at Rousseau Farming Company (left) and Albert Jayko speaks to the group (right).

Day 3: Monday 5 February

Yuma, Arizona: Automated Harvesting, JV Smith Companies and The Growers Company

Nestled on the border of Arizona, California and Mexico, Yuma boasts an ideal climate for vegetable production, particularly during winter when lettuce and spinach crops are grown. However, Yuma County also grows more than 40 kinds of vegetables and melons on more than 90,000 acres of land every year.

As Yuma buzzed towards the end of its leafy green production season, the group met Chris Rotticci from the Automated Harvesting Company, a division of Taylor Farms. This meeting showcased the potential of technology on-farm, as growers watched automated machinery use high-pressure water jets to harvest cos lettuce – at that stage it was harvesting 12 acres per day – which was then transported to a working platform on the machine where it was packed by hand. This system was developed to create a safer and more ergonomic environment for workers, improve productivity and provide a more consistent cut of produce. This initiative has also helped to retain workers.

Chris explained that both hand harvesting and automated harvesting crews are used, but work separately. The 22-strong hand crew can harvest around 350 pounds per hour, while the automated harvesting crew can harvest around 900 pounds per hour and reduce labour by 50 per cent. Weekly pathogen tests are also conducted for cabbage, celery, iceberg, broccoli, spring mix and spinach crops.

Automated Harvesting's machinery that uses high-pressure water jets to automatically harvest cos lettuce.

The next stop on the itinerary was JV Smith Companies, where participants met with Matt McGuire and Fatima Corona. The company farms approximately 30,000 acres across central Colorado, Arizona, California and Mexico, which predominately consists of vegetable crops including lettuce, romaine, spring mix, spinach, organic romaine and organic celery.

Using Google Maps, Matt provided a visual overview of the company's location of conventional fields, organic fields and fields that are transitioning from conventional to organic to meet consumer demand. He also provided more information about water rights and allocation in the area, as the majority of water is sourced from groundwater wells and the Colorado River, which borders Arizona, California and Mexico.

Food safety is integral to the culture at JV Smith Companies, particularly following the *E.coli* spinach outbreak of 2006, which was traced back to wild pigs contaminating the field. Matt explained that when animal entrance in a field is detected, it is necessary to leave a five feet perimeter from the tracks, and in some cases it is necessary to destroy an entire crop. As much of the wildlife in the United States is protected under federal law, JV Smith Companies works with researchers to find new ways of managing pests (such as falconry), as well as investing in fencing and employee training. In-house and third-party audits are also implemented to meet food safety requirements.

The final visit for the day was farm labour contractor The Growers Company. Trey Rodriguez provided a history of the business, which began in 1950 as a trucking company and now manages and provides transport for around 40 harvest crews, consisting of around 25 workers each. Many workers have remained with the company for more than 10 years.

Trey provided a detailed overview of the labour system in the United States and said that growers are currently facing a labour shortage, given the ageing workforce and local millennial workers moving to the construction sector rather than seasonal work.

He explained that mass unauthorised immigration of approximately 13 million illegal workers occurred from 1965-85, until the Regan administration introduced amnesty for qualified illegal immigrants – four million applied for legal status and around two million qualified. This made it illegal to hire an "unauthorised alien" and spawned the current H-2A program, which is becoming more widely used to source unskilled labour in the United States. The program is mainly used in Florida and Arizona, and top crops include lettuce and citrus.

Unfortunately, many view the H-2A program as cumbersome as it involves five government agencies and can cost between US$2,500 to US$5,000 for each worker, depending on their housing requirements. Under the program, it is guaranteed that 75 per cent of hours are offered on a contract, but does not take into account the unpredictability of weather and unexpected yields. Transportation and food must be reimbursed from the worker's home to the worksite area and housing must meet local, state and federal standards. These buildings are inspected and must also accommodate domestic workers who cannot reasonably return home. Trey mentioned that stronger compliance and enforcement for labour sourcing was introduced with the Obama administration,

and joint liability laws have helped to ensure that all of the responsibility does not fall on the grower.

Proximity plays a key role in labour sourcing, and the majority of workers for Yuma's growing season are sourced from Mexico as they are efficient and hard-working, with many crossing the border early in the morning for work and returning late in the evening. They are either paid the state minimum wage (US$11.00 per hour in California and US$10.50 per hour in Arizona), a guarantee rate or a piece rate. Trey explained that over 90 per cent of The Growers Company's workers are paid with a piece rate, which earns them from US$15.00 up to US$21.00 per hour. This system works efficiently and is self-regulated as a crew will often kick out an unproductive member of the team.

The Growers Company is responsible for sourcing labour while its sister company, Harvest Management, looks after transport and associated costs. The participants also toured the company's workshop where all transport and machinery is serviced and maintained. Trey mentioned that 30 per cent of the company is dedicated to organic production and is a growing segment of the operation.

At the end of Yuma's growing season, The Growers Company transports its machinery north to the Salinas Valley for summer production. Interestingly, Trey noted that the future of the industry was in automated harvesting.

Day 4: Tuesday 6 February

Imperial Valley, California: Vessey & Company, Oasis Farms and University of California Desert Research and Extension Centre

Today the group crossed the border to Holtville in California's Imperial Valley. Kay Pricola from Imperial Valley Vegetable Growers Association (IVVGA) joined the group for the day, and participants spoke to her about the challenges facing the local industry, particularly water access.

The Imperial Valley was originally considered a desert wasteland and was not farmed for more than 110 years. Water from the lower Colorado River transformed the area from its traditional roots in dairy, feedlots and alfalfa (lucerne) crops to high value crops such as winter vegetables and melons. There is now 450,000 acres of farmable land in the area. As summer temperatures can reach 120 degrees Farenheit (around 48 degrees Celsius), the Imperial Valley is a key production region in winter when the weather is sunny and mild.

With an average yearly rainfall of less than three inches, all water is sourced from the Colorado River, which flows on to Arizona and Mexico. The Imperial Valley receives the largest allocation of water from the river (3.1 million acre-feet), which is then divided into lateral irrigation canals. The bulk of the irrigation water is sent to field crops, which are primarily flood irrigated, and any excess water is deposited in the Salton Sea. Many canals are lined for conservation and growers are penalised for extra runoff. The farming sector receives the highest priority for water allocation, however growers must also contend with demand from cities in California.

The first stop for the day was Vessey & Company, where participants met the energetic and innovative Jack Vessey. A fourth-generation grower, Jack is also President of the IVVGA and a board member of Western Growers, the peak industry body for California's fruit, vegetable and tree nut growers.

Participants met with Jack Vessey (bottom right) of Vessey & Company.

Jack provided an overview of his growing operation, which spans over 10,000 acres and is the largest grower, packer and shipper in the Imperial Valley. Over 40 types of fruits and vegetables are grown conventionally and organically throughout the year, including broccoli, cauliflower and cabbage. Jack noted the rise in demand for organic produce and explained that 80 per cent of product is already sold prior to planting. His business model includes joint venture partners, which helps when planning production.

Jack also discussed the ramifications of the *E.coli* spinach outbreak of 2006, which had a devastating impact on California's leafy green industry. As consumers naturally avoided the affected commodity rather than a particular brand or grower, it highlighted that a cultural change was needed in the industry. Following the outbreak, the California Leafy Greens Marketing Agreement (LGMA) was established, which works with growers, researchers and food safety experts, government, shippers and processors to create a rigorous science-based food safety system that reduces potential sources of contamination on-farm. California LGMA has a sister program in Arizona, and together its members produce approximately 90 per cent of the leafy greens grown in the United States. LGMA members must comply with mandatory government audits multiple times throughout the season and must achieve full compliance with LGMA's food safety practices.

Next, participants had an opportunity to meet Scott Howitson from Oasis Farms, distributed by Lakeside Organic Gardens. The farm spans around 760 acres and most production occurs outside of the summer months as the crops are too hot to grow during this time.

Participants were led to fields where organic broccoli and kale were being harvested. It was interesting to note the ease with which the company harvests its 'rainbow chard', as lines of red, yellow and green chard are planted in close proximity and then harvested at the same time to create the multicoloured product. Scott mentioned the increase that growers are facing in transportation costs, due to a shortage of truck drivers and the introduction of an electronic log system, which regulates driving hours and prevent drivers from working overtime.

Participants witness broccoli harvested at Oasis Farms (left) and Scott Howitson discusses the intricacies of growing organic kale with the group (right).

Unfortunately, due to unforeseen circumstances, the group was unable to meet with Ralph Strahm as originally planned.

The final stop in the Imperial Valley was the University of California Desert Research and Extension Centre (UC DREC) where the group met with Centre Director Jairo Diaz. UC is one of many Land Grant Universities in the United States, which formed when advocates of practical education lobbied the federal government to grant land to eligible states in the 1800s. The land was then used to create universities for students to study agriculture, science, military science and engineering.

Jairo explained that the DREC focuses on key issues facing growers in the Imperial Valley and offers research and extension services with a focus on agriculture. The centre serves as a demonstration and educational site for growers and also hosts the Farm Smart agricultural education program, which reaches around 7,800 students annually.

Since its inception, the DREC has focused on many challenges of desert agriculture, including lack of water, extreme summer heat and management of pests and diseases. Jairo explained that the centre completes around 30 projects each year, with funding from federal and state governments and private donations.

California's field crops primarily use surface irrigation systems, which result in significant water losses. Research at the centre has focused on lining irrigation canals, automating flood irrigation and developing strategies to use less water in the summer. Plastic-tile drainage systems were also developed to maintain soil productivity by flushing salt from the root zone and increasing the yields and pest resistance of many desert-grown crops, including lettuce.

Due to the mild winter climate, the DREC is ideal for plant breeding and testing a variety of crops that can better adapt to climate change. This includes the development of new carrot varieties as well as lettuce and spinach varieties that can withstand higher temperatures, and have the potential to extend the Imperial Valley's growing season.

After returning to Yuma, a group dinner was held where participants reflected on their key findings from their meetings in Arizona and the Imperial Valley.

Day 5: Wednesday 7 February

Arizona – Florida: Travel day

Participants travelled from Yuma, Arizona to Orlando, Florida for the next leg of the mission.

Day 6: Thursday 8 February

Florida: Sizemore Farms, University of Florida Gulf Coast Research and Extension Centre and Lipman Family Farms

In the United States, Florida is the second largest producer of vegetables after California, and the leading producer of cucumbers, snap beans, squash and tomatoes. Citrus is the state's key commodity, however the recent incidence of citrus greening has devastated many farms, and these growers have looked to higher value vegetable crops as an alternative to extend the growing season.

For this leg of the mission, the group travelled with Sonia Tighe from the Florida Fruit and Vegetable Association (FFVA), which represents the grower-shipper community across the state.

The first stop in Florida was Sizemore Farms, which has produced vegetables, citrus and strawberries since 1903. The group met Alison Sizemore, who led participants to a field of strawberries in the midst of harvest, where they are packed directly into punnets in the field to ensure they are only handled once. These crops are grown on raised beds of plastic mulch and drip irrigation is installed under the plastic to irrigate and fertigate the crops.

Workers harvest strawberries grown on raised beds of plastic mulch at Sizemore Farms (left) and the Fresh from Florida marketing campaign encourages consumers to buy locally-grown produce (right).

Sizemore Farms uses precision agriculture methods such as soil and water sensors and aerial imagery to collect information about specific parts of the field. An integrated pest management program is also incorporated to analyse specific problem areas of the crop, and during the vegetable season, marigolds are planted around the border of the crops to attract natural predators of thrips.

Alison explained that Sizemore Farms sources its labour through the H-2A program. As these workers are recruited from Mexico, the growers pay for the workers' transportation and housing, which can be inspected by the Department of Labor at any time.

During the visit, participants learnt about the 'Fresh from Florida' marketing campaign, which was introduced by the state's Department of Agriculture to combat the growing pressure of imports from Mexico and South America. Alison said that the state government introduced the initiative to support its growers and encourage consumers to buy local, as agriculture is so important to the state.

The group also visited a trial site of blackberries, which uses a unique trellis system through a partnership with the University of Florida/Institute of Food and Agricultural Sciences (UF/IFAS). This structure can be moved from a vertical position to an angle, which forces the blooms to one side. It can also be moved up and down, which makes harvesting more efficient.

The blackberry trial site at Sizemore Farms uses a unique trellis system.

The next stop was a working lunch at the University of Florida Gulf Coast Research and Extension Centre (GCREC), where the group met with Centre Directors Jack Rechcigl and Gary Vallad. Established in 1925, the 475-acre facility is one of 12 research centres under the University of Florida and aims to develop and share research to help Florida's growers increase production and remain competitive. The GCREC specialises in vegetable, fruit and ornamental research, as these commodities are the most important to the region.

In the vegetable sector, the GCREC focuses on ag economics, breeding, entomology, pathology and weed science. Similarly to the west coast, the organic industry has also grown considerably in Florida.

As witnessed at Sizemore Farms, almost all vegetable crops in Florida are grown on raised beds with plastic mulch for better drainage, with herbicides, irrigation and fumigation supplied under the mulch to maintain a controlled environment. Participants learnt about new technologies and practices the GCREC has trialled for vegetable growers, including a spray to deliver herbicides to soils in plastic mulch at different speeds. Participants also viewed a video of a machine designed to destroy nutsedge seed, which can penetrate the plastic mulch. This technology has 99 per cent accuracy and can be taught to detect different weed species, as well as those in the shade. It is linked to a smart sprayer which only deposits herbicides where they are needed.

Participants learnt that every county in Florida has extension officers, who provide an important link between research and on-farm application.

The group then toured the facility and met researchers who specialise in different disciplines. The first stop was the nematode laboratory, where research is conducted on root knot and foliage nematodes. Participants also met

a tomato breeder, who said the commodity was the top vegetable crop in the state, while a PhD student provided an overview of the use of UV lights as an alternative method to reduce, suppress or control diseases such as powdery scab and downy mildew in tomato, peppers and cabbage. The trials are conducted at night when there is no radiation and the plants are exposed to the UV light for 3.5 seconds. This helps the researchers better understand the pathogen and its lifecycle.

The university is also looking at research involving alternative crops such as hops and artichokes. The globe artichoke shows great potential to overcome growing challenges in Florida, such as warmer winters. Participants viewed variety trials of artichokes where different amounts of nitrogen fertiliser were applied to test the performance of the plants.

Vegetable trial site at the GCREC.

The final stop for the day was Lipman Family Farms, where participants met the enigmatic Larry 'Boss' Moss. The business was founded in southern Florida and has since become the largest field tomato grower in the United States, and also produces vegetables including cucumber, pepper, eggplant and squash, as well as organics, fresh cut product lines and watermelon.

At the time of the visit, the farm was preparing for the next round of tomato crops, which consist of around 4,300 plants per acre. The farm produces 1,500 acres of tomatoes per year and the average harvest is 2.5 million pounds per day. Larry said the local Duette area featured a subtropical climate and better soil profiles than other regions of the state, and that he had witnessed the farm transform from open ground farming to its current growing approach of raised beds and plastic mulch with drip/micro irrigation.

Lipman Family Farms grows its own transplants to achieve uniformity, higher yields and better disease resistance, and has heavily invested in R&D in tomato seed to develop better and more sustainable hybrid varieties, including a proprietary tomato variety that was bred specifically for Florida. The process typically takes about seven years and goes from seed to lab to field and back again over several growing cycles until stable parental lines are produced. These hybrids are tested across the country and analysed for the desired traits.

Larry also explained the development of the "Lipman Local" initiative, which allows the business to partner with smaller local growers throughout the east coast of the United States. It has developed a packaging and distribution network to deliver fresh produce across North America throughout the year and simultaneously reduce its transportation and environmental impact. This has become a cost-effective approach to incorporate smaller farms under the Lipman brand, allow traceback of product to harvest, increase access to distribution and streamline food safety requirements, which encompass the entire farming and packing operation.

Lipman Family Farms also reduces waste by donating unused produce to food-insecure families as well as livestock. The business has also partnered with local engineering firms and universities to process second grade tomatoes into biogas and potential biofertilisers.


Lipman Family Farms prepares its next round of tomato crops (left) and workers install stakes (right).

Day 7: Friday 9 February

Florida: Southern Hill Farms, Wild Goose Farms and H&A Farms/Billy Long Packing House

Southern Hill Farms is a third-generation blueberry farm situated in Clermont, near Orlando. The group met with owners David and Lisa Hill, who have successfully introduced an agritourism component to the business, creating a winery-style experience for visitors to harvest blueberries as part of its 'U-Pick' program.

David explained that the state of Florida reclaimed the family's original sweet corn, carrot and radish farm as wetlands in the late 1990s, which forced them to move to a new location and rebuild the business with a new vision. The current farm spans 120 acres, 40 of which are dedicated to the production of 10 blueberry varieties, totaling around 65,000 plants.

When David's son Michael introduced the idea of trialling the 'U-Pick' business model to capitilise on consumer desire to buy local produce, David was originally sceptical of the idea and hesitant to open the farm to the general public. Given the farm's close proximity to Orlando – a city that is heavily focused on tourism where many locals explore the surrounding area on weekends – the farm was in a perfect position to trial the initiative in 2014, with great success.


Southern Hill Farms has created a successful agritourism component to the business through its U-Pick program.

David explained that the U-Pick season works well from a marketing perspective for the business, as it is a pre-cursor to the commercial season. Early varieties are planted in a specific area of the farm and visitors are welcome to pick these blueberries from March to May for US$4.00 per pound. When the U-Pick season ends, the commercial varieties are then harvested.

The U-Pick business model has grown significantly and David and Lisa have dedicated time and energy to add something new to the farm each year. The property now hosts a barn, upstairs deck, kitchen, playground, restrooms and handwashing stations, food trucks, live music and even yoga sessions during the U-Pick season. After picking blueberries, consumers can relax and purchase homemade blueberry cobbler, lemonade, jams and muffins, or take a short tour of the farm on a repurposed cotton-picking machine. The farm is also a popular venue for functions such as weddings throughout the year, providing an additional revenue stream for the business.

The farm can attract between 2,500 and 3,000 visitors a day in the peak U-Pick season and David said the initiative has created a strong community spirit as consumers are keen to meet the farmers in their local area.

With newfound inspiration, the group continued to Wild Goose Farms, a diversified family farming business established by Chuck and Vesna Allison. From its beginnings as a small citrus company, the business now has four operating divisions: Spring Valley Berries, Spring Valley Packing, Grand Island Citrus and Kicking Kow Beef.

The team from Wild Goose Farms (left) and a citrus crop (right).

The group visited part of its 120-acre blueberry crop, as well as a citrus crop. Chuck explained that the business has diversified across 10 varieties of blueberries to manage risks and as a result, cross-pollination is important. Unfortunately the local bee population can't sustain the 4-5 bees that are ideally needed to pollinate each bush of blueberries and as a result, the farm leases bees to complete the work.

Wild Goose Farms has also introduced a range of community initiatives to give back to their workers who play a key role in the business. As the majority of its workforce is made up of migrants – with up to 200 workers on-farm during peak harvesting times – the business partners with local schools and a Christian migrant association to care for the workers' children and ensure they continue their education while their parents are working. Wild Goose Farms also partners with a medical clinic to provide free dental, optical and medical treatment to over 100 farm workers. At the end of the blueberry harvest, the farm hosts a fundraising event to raise money for these charities. These initiatives ensure a steady, returning workforce without the need to use a H-2A program or contractors.

The team from Wild Goose Farms kindly hosted the group for lunch and cooked a traditional meal, once again reinforcing the inherent values of the business.

The final stop for the week was a tour of H&A Farms/Billy Long Packing House, which packs and markets blueberries for several local growers. The group met Michael and Brooke Hill, of Southern Hill Farms, and Ryan Atwood, who explained the history behind the development of the packing house. While looking for a way to increase the scale of his family's operation, Michael teamed up with Ryan, a former extension officer from UF/IFAS to brainstorm a better marketing strategy for Florida's blueberry industry.

The end result is the Billy Long Packing House – named in honour of Michael's grandfather – which uses around five marketers to deal directly with retailers. This sidesteps the need to use a single marketer, which is the norm in Florida, where growers have little control over the amount they are paid for their produce.

Michael and Ryan pack and market blueberries from their own farm as well as around 18 other growers. The facility has the capacity to hold up to six packing lines and was expected to pack four million pounds of blueberries in the 2018 season.

As Florida faces tough competition with blueberry imports from Mexico and local production in Georgia, Michael and Ryan built the system to send the best possible price back to growers, including an advance of US$1.00 per pound to cover any upfront costs. Retailers are told the volume of product expected and must commit to a price – the average price is then divided between the growers in line with their yield.

Built from scratch, the packing house was designed to reduce the temperature of the blueberries as they pass from one section to another. Technology within the packing house also provides full traceability of the product from the moment it arrives to the moment it is distributed, as well as automatic notifications if there is an issue in the building. This allows the packing house to track variety, yield and volume, which is provided to the grower at the end of the season. The packing house follows the highest standard for food safety certification and participants were interested to hear that the United States Department of Agriculture (USDA) provides third-party auditing of disputed 'knockout' produce.

To finish the week in Florida, a group dinner was held with Sonia to continue discussions about the meetings held over the past two days.

Michael Hill (left) shows participants through the Billy Long Packing House.

Day 8: Saturday 10 February

Florida: Rest day

Today the participants enjoyed a well-deserved rest day in Orlando, Florida.

Day 9: Sunday 11 February

Florida – California: Travel day

After an early morning start, participants returned to the west coast of the United States. Given the time difference, participants explored the sights of San Francisco before travelling to Salinas for the second week of meetings.

Day 10: Monday 12 February

Salinas, California: Taylor Farms and Western Growers Centre for Innovation & Technology

The second week started on a high, with a visit to Taylor Farms' salad processing facility in Salinas. Taylor Farms is one of the largest producers and processors of salad and vegetables in the United States and partners with over 100 family growers across the country to reduce food miles. The majority of raw material is sourced from growers near each of the company's 14 processing facilities.

Participants met Taylor Farms Retail Vice President – Operations Jerrett Stoffel, who said that Taylor Farms pioneered salad growing in the United States. Third-generation grower Bruce Taylor founded the retail division of the company, Taylor Fresh Foods, in 1995, and now Taylor Farms is divided into three sectors: production, retail and deli. Jerrett explained that the salad processing facility, which was opened in 2006, is dedicated to Taylor Farms' retail division and was designed to run packaging facilities efficiently, both for conventional and organic produce, as well as regular and value-added salad products.

Jerrett said more retailers in the United States are increasing their refrigeration space for fresh produce to drive profitability. When it comes to new product development, Taylor Farms employs three scientists to help keep up with consumer demand, investing around 60 days of development time for existing products and up to 150 days for new products. Three shelf life trials are also conducted to help predict the performance of the product and packaging. Jerrett said that Taylor Farms' fresh salad products have a 16-day shelf life through the development of a new technology that modifies the atmosphere within the packaging.

Taylor Farms has placed an extensive focus on sustainability, particularly in terms of generating renewable energy. The company has installed fuel cells, which run on natural gas and produce one megawatt of power, which covers approximately 20 per cent of the processing facility's power needs and reduces the company's carbon footprint by about 30 per cent. In addition, around 2,300 solar panels are installed on the roof of the Salinas processing facility to generate an additional 675 kilowatts of power. The processing facility based at Gonzales also receives one megawatt of power from a nearby wind turbine.

Participants were fortunate to receive a behind-the-scenes tour of Taylor Farms' salad processing facility in Salinas, which receives nearly 16,000 tonnes of product every week and has 12 wash lines and 18 packaging lines. The processing facility is divided into three shifts over 24 hours, with all equipment sanitised at the end of the day (from 1.00am). Staff are required to wear protective clothing, wash their hands, walk through a foot bath and scan their pass before entering any working area of the processing facility.

Participants with Jerrett Stoffel at the Taylor Farms test kitchen facility.

In terms of food safety, Taylor Farms monitors chlorine, pH and temperature levels of the washing water in real time. The company has also developed a patented smart washing additive, which allows chlorine in the water to be more effective and eliminate the potential for cross-contamination, as well as the spread of microbes throughout the product. Due to intellectual property concerns, no photos were allowed to be taken at the Taylor Farms salad processing facility.

The group then had a working lunch at the Western Growers Centre for Innovation and Technology in Salinas. Founded in 1926, Western Growers 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.

Participants met Western Growers Innovation Lead Dennis Donahue, who explained that the centre was developed as a hub for innovation and new technology in agriculture, in order to achieve Western Growers' goal of feeding more people with fewer inputs and leaving a smaller imprint on the world. While Western Growers is interested in technologies that will help to reduce labour costs and inputs, there are no limitations on the type of technology that may be introduced or the issue that might be targeted.

The centre has connected with more than 50 qualified startup companies that have developed innovative agtech solutions to meet the demands and challenges of growers, shippers and fresh food processors. Rather than acting as an 'ideas place', the centre offers these companies the value proposition of market access and holds webinars and networking events where the agtech representatives can pitch their ideas to growers directly.

Following the introduction from Dennis, participants had an opportunity to hear from a range of startup agtech companies about their businesses and value-adding options for growers.

Day 11: Tuesday 13 February

Salinas – Sacramento, California: USDA Agricultural Research Station (Salinas)

Plant disease research in spinach and lettuce crops was the topic of the day during a visit to the USDA's Agricultural Research Station in Salinas, where participants met with Dr Steve Klosterman. Steve works within the Crop Improvement and Protection Research Unit at Salinas, which aims to increase knowledge that facilitates the sustainable production of vegetables, sugar, fruit and ornamental crops. Research projects include breeding and genetics, plant pathology, entomology, organic vegetable production and iR-4 minor use pesticides in crops such as lettuce, melon, spinach, artichoke and strawberry. Steve mentioned that sugarbeet was a key crop in Salinas until it was devastated by a pathogen that causes hairy root.

The research station in Salinas has developed powdery mildew-resistant melon, monogerm sugarbeet, and the 'Salinas' cultivar of head lettuce that was released worldwide. Researchers have also identified about 40 new viruses and focused on areas including verticillium wilt of lettuce, as well as sudden oak death and cover cropping.

Steve explained that the Salinas Valley is an extremely productive area for spinach, as well as broccolini, lettuce and cauliflower. Around 65 per cent of the United States' fresh market spinach is grown in California, with around 50 per cent of that production from the Salinas Valley. The spinach crops in the area are often planted at high density, with around 3.5-4 million seeds per acre for baby leaf crops.

The cool coastal climate of the Salinas Valley is favourable to the development of downy mildew, which is the biggest threat facing spinach crops. Interestingly, new downy mildew races have appeared rapidly, increasing from two in the 1960s to 13 today. Breeders are struggling to keep up with the disease as it is very difficult to control, particularly in organic spinach crops.

Since 2012, Steve has been working on the pathogen, *Peronospora effuse*, which causes downy mildew in spinach. It produces yellow spots on the top leaf surface, while the underside of the leaf has grey to purple downy masses of spores. Steve explained that the pathogen is very sensitive in how it grows in terms of the temperature and humidity range, and researchers are investigating how long the pathogen can survive and how seed treatments can affect the performance of the oospores.

The research station has introduced airborne spore trap sampling and leaf sampling to improve the management and prevention of downy mildew in spinach. One project involved the analysis of early infection in spinach leaves and how this could be used as a disease warning for organic and conventional spinach crops. Three field plot experiments were conducted and successfully detected downy mildew infection in the leaves seven days prior to the symptoms developing, which could help to control the disease before it spreads to the entire crop.

As *P.effusa* is a seed-borne disease, researchers also investigated the development of oospores from spinach seed, which are predicted to survive for 2-3 years in the soil. Its presence in modern spinach seed lots could help to explain the rapid appearance of downy mildew. This reinforced the importance of sourcing clean spinach seed from healthy plants.

The discussion then moved on to lettuce production in the Salinas Valley, which supplies around 45 per cent of

lettuce in the United States. Steve explained that verticillium wilt of lettuce affects crops around 1-2 weeks before harvest, causing the outer leaves of the plant to collapse. Verticillium in spinach seeds can also cause the disease on subsequent lettuce crops. Research has focused on detection of the pathogen *in planta* using petri plate tests, analytical grinder/seed assays and DNA tests. This work provided researchers with the tools to investigate the genetics of the pathogen.

Steve added that researchers have also looked into the importance of microsclerotia in the disease cycle of *Verticillium dahliae,* which has a broad host range and can survive long-term in the soil. Researchers found that UV treatment can reduce the survival of the disease, as well as temperatures around 40 degrees Celsius.

Following the presentations, participants toured the research station before continuing on to Sacramento.

Dr Steve Klosterman (left) and the spore trap instrument used to detect downy mildew in spinach crops (right). The trap is coated with grease and spins around to catch spores from the nearby spinach crop. It can operate 24/7 using a solar-powered battery.

Day 12: Wednesday 14 February

Sacramento – Modesto – Bakersfield, California: Bayer Biologics and Ratto Bros.

In California's state capital, participants visited the global headquarters of Bayer Crop Science, a division of 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.

Denise Manker hosted the group and provided an overview of the biologics sector of the business, noting that market drivers favour biological products, as pests are unlikely to become as resistant to biologics. According to Bayer, biologicals 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 company focuses on three main research areas including disease management, pest management and crop efficiency, from discovery to lifecycle management. Microbiology, natural product chemistry and plant pathology are also key areas of research. Denise said that Bayer looks at integrated crop protection programs to get the best outcome, including pre- and post-harvest application.

Denise included 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 rhizosphere (plant root systems) to create an improved root system in the plant and more efficient nutrient uptake. The product can also work well with other crop protection products.

The day before the visit, Serenade Opti was also registered in Australia. This product complements Serenade Prime as it works as a contact foliar fungicide that disrupts pathogen cell membranes in a plant.

Following the presentation, the group toured the biologics production facility with Senior Plant Pathologist Tad

Smith. The site was originally a pharmaceutical facility and was redeveloped to include an efficient decontamination system that ensures any microbes are contained within the facility. The site also serves as a backup for other Bayer sites in the United States.

Tad said that formulation is the key to stability and Bayer has strong fermentation expertise and strong, cost-effective processes for the commercial production of biologicals. The site also features a biologics greenhouse to support research in crop efficiency, disease management and pest management, while a pilot plant provides the expertise and the intermediate-sized equipment to provide the link between research and product manufacturing.

Following the tour, participants met with around 20 Bayer scientists to discuss their key on-farm challenges and areas where crop chemistry can assist the Australian vegetable industry. Bayer's researchers were interested to know how many biological products growers currently use on-farm and what the company can do to add value. Grower feedback included clearer labelling on crop protection products and more information on product use.

Tad Smith (left) provided a guided tour of Bayer's Biologics facility.

With a greater understanding of the intricacies involved in biologics, the group continued south to Modesto to visit Ratto Bros. Fourth generation grower Anthony Ratto met the group and explained how the vegetable business has rapidly expanded from its origins near Oakland, California where produce was delivered to customers in a horse-drawn cart, to its current location of several hundred acres in the San Joaquin Valley. The business produces more than 40 crops and 70 varieties of herbs, leafy greens, fruits and other vegetables throughout the year. Ratto Bros. is a member of California Certified Organic Farmers and offers a wide range of organic herbs and vegetables to meet the growing consumer demand for organic produce.

With such a rich family history, participants were interested to hear Anthony's perspective on the challenges that he has experienced as a member of the younger generation shifting the focus of the business into the future and working with existing family members. Anthony highlighted that farming practices need to get smarter every year, and that growers must be clever about costs and inputs and respond quickly to challenges and opportunities.

Ratto Bros. is considered a niche operation in the area as many dairy farms are located nearby. Given this, food safety is a crucial part of the company's culture and maintaining product quality is considered the responsibility of every person in the organisation. A recall and traceability program is tested every six months, while weekly soil samples are tested at the farm's in-house laboratory, with a 1.5-day turnaround of results to safeguard against any potential food safety issues.

As produce is handpicked and packed in the field to minimise damage and blemishes, there is a high demand for labour – 225 people are employed throughout the year and an additional 100-150 are required in seasonal periods. To address the labour shortage, Ratto Bros. is looking to increase wages by US$12-13.00 per hour to attract local workers and avoid using the H-2A program.

Anthony explained that Ratto Bros. has built its own software system which outlines the spraying/planting schedule, crop production, financials etc. Around 10-15 years of data is built into the system and information such as tank mixes, lab sampling and harvesting quantity is updated in real time and can be accessed remotely.

The group then toured the farm with Ranch Manager Brandon Narron. He showed participants the 70,000 square-foot cooling and packing house, which is centrally located on the farm to strengthen the cold chain process. Post-harvest technology includes hydro, vacuum and forced air cooling methods, as well as the ability to 'top-ice' produce boxes and pallets for shipment. Once cooled and washed, produce is transferred to refrigerated loading areas. The farm is located in between two main roads, which provides good access to distribution centres in northern and southern California. A solar farm was also installed to provide energy for the hydrocooler in the summer months.

After the visit, the group continued on to Bakersfield.

Brandon Narron (centre) explains the irrigation system at Ratto Bros.

Day 13: Thursday 15 February

Tulare, California: World Ag Expo

Today the group travelled to Tulare, California to visit the World Ag Expo, a three-day event that is considered to be the world's largest annual agricultural expo. Featuring 1,480 exhibitors and around 2.6 million square feet of exhibitor space, a broad range of innovative farm equipment, technology and on-farm resources were on display.

Participants visited the exhibitors and presentations of relevance to them, with many organising meetings in the weeks leading up to the mission. Growers enjoyed the opportunity to meet with farm equipment manufacturers, make new contacts and discuss areas of importance to their business and in some cases, order products that are difficult to source in Australia. The scale of the event and the innovative machinery on display left delegates with many ideas about how they can increase automation, technology and other innovations on their farms in Australia.

There was plenty of equipment and technology on show at the World Ag Expo.

Day 14: Friday 16 February

Bakersfield – Los Angeles, California: Bolthouse Farms and Grimmway Farms

The final day of meetings in the United States was dedicated to carrot production, with a visit to the two biggest carrot producers in the Bakersfield region – Bolthouse Farms and Grimmway Farms. When combined, the two companies supply over 85 per cent of all carrots within the United States.

Aaron Mabry and Scott Gisbertz, who are responsible for harvest and field operations at Bolthouse Farms, escorted the group to a nearby carrot field which was ready for harvest. Aaron and Scott explained that the business farms around 7,000 acres and the climate and sandy soils in the Bakersfield area make it ideal for carrot production. Planting of short cut carrots is crowded to create a more uniform shape, and there are around 120 plants per foot and 1.3 million seeds per acre. This is in comparison to around 50-60 plants per foot for other varieties.

Aaron and Scott are responsible for inspecting the crops every day and taking samples, as well as monitoring crop performance and risks such as disease pressure. Sample carrots are shown at weekly meetings with the production and processing teams. While the company should logically harvest in order of planting, it trusts the farm managers' opinions of the crops that are ready. The plant manager is informed of yield expectations around 2-3 months in advance, but the farm managers have some influence on the production schedule at the factory.

Bolthouse aims to avoid waste by producing a range of juices and concentrates for domestic and overseas markets. Unfortunately, due to a recent change in company requirements, the group was unable to visit Bolthouse's processing plant for fresh carrots, pre-cut carrots ('baby carrots') and juicing/concentrate as originally planned.

Aaron Mabry (left) shows participants a crop of carrots ready for harvest at Bolthouse Farms.

However, a last-minute visit was organised to Grimmway Farms, which produces a range of product lines including fresh carrots, baby carrots, snack carrots, shredded carrots, carrot chips, crinkle cut carrots, carrot sticks, microwaveable carrots and organic carrots. Grimmway Farms began in 1969 and started growing carrots as a rotation crop between corn harvests in 1971. Its processing facility is based in Bakersfield where the climate also allows for two annual carrot crops.

The group met Grimmway Farms' Gloria Romero and Bryan Mojarro, who led the participants through the fresh carrot packing facility which was operating at the time of the visit. The participants watched carrots freshly harvested from the field as they were washed, sorted, graded and packed. The product was then cooled and separated into organic and conventional. The business packs for its own brand, Grimmway Farms, as well as Bunny Love and Cal-Organic.

Following the visit, the group returned to Los Angeles. A group dinner was held where participants shared their highlights from the mission and key findings.

Day 15: Saturday 17 February

United States – Australia: Travel day

After two weeks of insightful visits and the opportunity to forge strong networks with local and international colleagues, participants returned to their respective home states with increased knowledge of the horticulture industry in the United States.

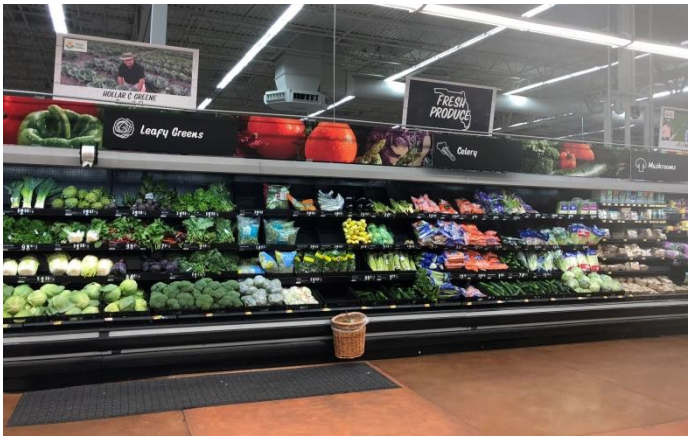
Ongoing: Retail visits

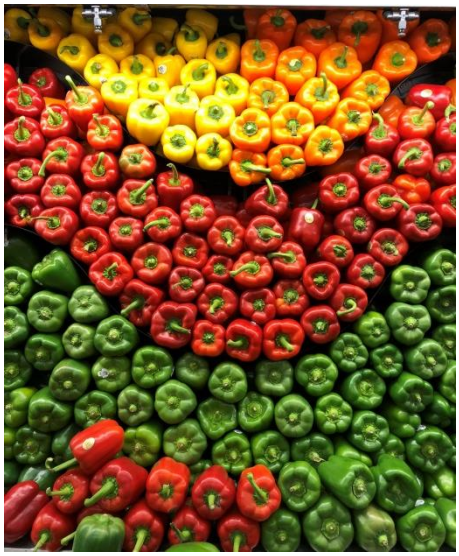
During the mission, participants visited a variety of supermarkets and fresh produce retailers in Arizona, Florida and California during their free time to examine the ways that growers and retailers present fresh produce on the shelves, as well as the different product offerings available to consumers.

The fresh produce section was a key drawcard for many retailers, with colourful produce on display and creative call-out sections to help consumers easily identify different vegetable commodities, such as leafy greens. A range of value-added products were on display, from ready-to-eat bistro bowls (a combination of protein and fresh produce) and 'nourish bowls' that bring a full nutritional offering, as well as ready-to-cook vegetable-based meals.

An extensive display of organic produce was common among many retailers and a dedicated effort was made to separate this produce from conventional and value-added offerings. The names, photos and stories of local growers was also a common feature, as well as state pride in locally-sourced produce. In one supermarket in California, automatic misters intermittently sprayed produce on the shelves with water to keep it fresh.

More retailer images can be found in AUSVEG's online gallery.





Outputs

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

In particular, AUSVEG has actively encouraged participants to share their new knowledge with delegates at Hort Connections 2018. Six participants from the mission were able to attend the convention, which provided access to 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, 'Growers return from USA mission with memories and motivation' and online photo gallery in the Weekly Update e-newsletter published on 27 February 2018, which is distributed to approximately 3,200 industry members. The mission was also promoted on AUSVEG social media channels including Twitter (3,363 followers at the time of publishing) and Facebook (1,615 followers at the time of publishing – see Appendix 3 for the full post).

AUSVEG also published the article, 'Aussie growers get a taste of the states, from east to west' on page 22 of the May/June 2018 edition of *Vegetables Australia*, which communicated the key findings from the mission and outlined six meeting highlights. The magazine is the most widely distributed publication in Australian horticulture, as it is received by approximately 5,500 industry members.

At the time of the writing, interviews with participants were also in progress for an upcoming InfoVeg podcast on the benefits of participating in international grower tours for the vegetable industry.

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 U.S.A. Industry Leadership and Development Mission provided nine Australian vegetable industry members with exposure to the latest in vegetable and horticulture production practices and technologies employed by their international counterparts. 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 right, the mission facilitated the opportunity for participants to take up leadership positions in the future and 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 Arizona, California and Florida, as well as the World Ag Expo. 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; using more biological additives at planting and building organic matter within the soil; different methods of ground preparation, tilling and irrigation; increasing efficiency; and trialling new methods of disease control. The participants also noted the increasing importance of organics in the United States and realised that Australia is performing well in comparison to the American vegetable industry.

As participants only grow a select number of product lines, many 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 three states visited, it became clear that the scale of vegetable production in the United States far outweighs Australian growing operations, but this gave participants a greater appreciation of how their colleagues in America manage production on a larger scale 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. Many growers identified new technologies, such as automated harvesting and biological crop protection, as promising solutions for implementation in the Australian vegetable industry. The World Ag Expo was considered a one-stop-shop for all things agriculture and many participants came into contact with new equipment and technologies that they can access in Australia.

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

During the mission, many participants came across innovative ways to value-add or create an off-farm income 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 American growers have used to design packaging that is highly appealing to the consumer. Some of these products were borne purely out of consumer demand, which reinforces that Australian vegetable growers have an opportunity to look more closely at what the consumer desires, especially when it comes to convenience.

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 four Australian states and they each held a different role within their respective businesses, from business owners with whole-of-farm responsibility to agronomy and 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 the United States horticulture industry throughout the mission and were 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 American 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 operations.

Providing networking opportunities for Australian growers is essential to ensuring that 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. This helped participants 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.

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

- "All visits were of high quality as all farms and businesses openly discussed their day-to-day operations … also good to network with everyone on the trip."
- "This trip was more than I expected. It was great to see how other countries apply the same or different practices for growing vegetables and fruits. It was great to also see the massive scale of land and crop selection that these farmers farm at. Also just the networking and meeting of other growers on this trip from within Australia."
- "I believe there are a lot of things to take from this trip home. From different ways of growing methods, water saving operations and being a little bit more cost-effective within our own business."
- "The access to US farms, process facilities, research stations and labour companies was amazing. Well worth the time away from the home and farm."
- "Every visit provided a new transferable idea."
- "It was broad and engaging. Gave us access to some brilliant people. We couldn't have that access as individuals. All chats were candid and open. Covered a lot of ground and diverse opinions within the industry."
- "Brain-stretcher – for me it crystallised my thoughts on many levels. It also offered a vision of scaled operations that are purely concepts for me currently. It will aid in more precise (strategic) planning."
- "It has changed my view on how to go about scale so I will go forward with that knowledge. Lots of little take-homes from agripolitics to mechanisation."
- "It assisted with future short-term decisions that involves employment and models, mechanisation needs, scale up and expansion, structural and facility changes along with packaging versus QA needs."
- "I enjoyed the variety of visits on offer, which provided a good balanced look at horticulture in the U.S.A. Access to large businesses to see the scale on which they operate was a trip highlight. Harvesting 160 acres/week of leafy greens has to be seen to be believed."
- "I would definitely recommend the mission to other growers. It was a great experience that I believe all invested in Australian horticulture could benefit from."
- "I believe I got so much more out of this trip than I expected. It was a great cross-section of growers, different crops, researchers and processors and gave an excellent insight into agriculture in the U.S.A. and the challenges that are being faced."
- "Very informative. Good variety of visits that gives a good background into different fields. It fuels innovation in Australia as I'm very keen to take the learnings from this visit back to Australia and implement some changes and trial new ideas."
- "I think these trips are very valuable as they help broaden our thinking beyond Australia. It is great to see how other countries produce similar commodities and really gives food for thought about future innovation and where to next in the Australian market."

Arizona

- "The visit to Duncan Farms was a great start to the trip for getting a scope on the organic industry in the U.S.A. Also their composting techniques and high quality was a good thing to see."
- "(Duncan Family Farms) Great presentation, relatively open discussion layering through many of the on-farm challenges of organic farming systems and a good insight into strategies to deal with them, particularly the compost."

- "Talking carrot production and seeing a four-row harvester with Rousseau Farming Company was very valuable."
- "Seeing the scale of lettuce production and the mechanical harvesting was interesting… The Growers Company was the highlight of the day – Trey was knowledgeable, hospitable and entertaining. A must-do for future trips."
- "Enjoyed the JV (Smith Companies) presentation as it gave a broader overview of water, sources etc."
- "The Growers Company offered some great insight into the labour situation in the US and there was lots of interesting information and history."

California

- "Meeting Jack Vessey and discussing horticulture with him was very good! Getting out in the paddock with Scott from Oasis was also very good. My take home point from these two operations was that the grower-supplying-packer model is quite prevalent and successful in the U.S.A."
- "Enjoyed talking about the constraints of farming/politics/legislation and their strategies to deal with them (Vessey & Co). Enjoyed seeing hand harvest specific to bunching lines. Cartons and tags used were interesting (Oasis Farms)."
- "(UC DREC) was interesting to see how much they help and put back into the farming community."
- "Was great to get an inside view of one of the largest processors in the country (Taylor Farms). The scale and volume was unreal. Western Growers was good to see how they invest in ideas to try to improve the industry."
- "I enjoyed the visit to Taylor Farms the most. I believe we were given an opportunity to get behind the scenes that would normally not be accessible. There are some great learnings from this visit that will be very valuable to the Australian industry."
- "Taylor Farms' facility was very impressive. It goes to show how far a commitment to quality will take a business. Western Grower Centre was interesting – it was good to see an industry body so committed to the future of horticulture."
- "(USDA ARS) Interesting to see how much work goes into studying disease and problems farmers face while in the paddock and how they try to help."
- "The works presented (at USDA ARS) was relevant to current issues I face so it was good for me."
- "Tour of Bayer was a highlight of the whole trip."
- "The Bayer facility is out of this world. The future of ag is very exciting. We still have so much to learn."
- "Bayer Biologics (had) very good facilities, very good presentation on their products. Meeting scientists was good because they are always stuck in the laboratory and growers are always in the field so there is no direct connection with them usually."
- "First time seeing and hearing about the long process it takes from developing a formula to progressing through to have a permit passing all the checks (Bayer). Anthony Ratto was very welcoming talking about the changes his family has had to make over the many years to make the business sustainable."
- "Ratto's spoke to problems that we haven't touched on so far … it strongly reflected issues with corporatisation and family relationships in business."
- "(World Ag Expo) Plenty of impressive equipment worth looking at. Some upstart precision ag exhibitors were very accommodating with good ideas to provide actionable data."
- "It was good to see all that was on offer at the Expo. The highlight of the day for me was viewing the latest in tractors and planters as well as talking to the salespeople there."
- "Found some good information on pivot irrigation (at the World Ag Expo). Also (saw) some handy farming equipment that applied to my field."
- "Awesome experience to see one of the best ag shows in the world. It was great to be able to converse with the companies and exhibitors about new concepts – also great to see so much new machinery that we have at home."

- "It was good talking with the managers from Bolthouse and seeing the crop and harvester. Discussing disease and pest control was a highlight, along with seeing the sheer volume of product going through the Grimmway packing facility."
- "Visit to carrot farm and processing very inspirational. They are not lines that I grow but some of the key processing equipment would be of interest to growers in my district."
- "Grimmway Farms – very impressive to observe the scale and volume of their operation. I can see some increased efficiencies and improvements we can make at home."

Florida

- "Interesting to see strawberries being harvested and tomatoes being planted. Learnt more about the pay system for harvest and the way they prep ground for plant. Trellis system for blackberries was extremely new to learn about the different climates during growing."
- "Seeing the height of numbers in the picking team of Sizemore strawberries fields was an eye-opener. Some of the technologies and work on genetics at the Florida University was also a big highlight."
- "Talking tomatoes with Lipman Farms was interesting given the similar climate to our Bowen farms. Staff at the GCREC were very hospitable. Take home point was the availability of research extension staff in Florida."
- "Wild Goose Farms was well set up and very hospitable. Was excellent to chat with the staff over lunch."
- "Great to see and learn about the blueberries growing (Southern Hill Farms) but especially about the packing factory and marketing side of the business (Billy Long Packing House). From growing to chain store. Very organised and articulated operation, some practices you could implement at home in Australia."
- "The U-Pick presentation surprised me the most actually. It was good to see someone doing something different to spread their income. Seeing the packing shed at Billy Long's was one of the highlights of my trip."
- "(Southern Hill Farms) good presentation and good potential … similar to winery feel which I think could be good if incorporated with vegetable growing, getting people to farm, enjoying fresh fruit and veg and enjoying farm life."

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 to Australia), 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.
- Investigate alternate timing of the United States mission to include summer production and a greater variety of vegetable crops, as well as vegetable production in southern Florida.
- 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.
- Include visits to processors, distributors and retail outlets to complete the understanding of the supply chain.
- Include an opportunity for participants to spend an extra day at the World Ag Expo if they wish.
- 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.
- Where possible, continue to 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.
- Where possible, organise rest days in cities with more sightseeing opportunities and hotels that are in close proximity to restaurants.

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:

- Support and regulate biological product development.
- Build relationships with automated harvesting equipment and the increased improvements in agtech.
- Introduce a standard label format through the APVMA.
- Create a network of spore trapping sites.
- Push for independent third-party audits of disputed produce knockouts.
- The effects of agriculture on the environment should be balanced with more educated and thorough discussion with government on community footprint, particularly where development of landscape and access to resources are concerned.

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 U.S.A. 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 World Ag Expo registration, 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 Cory Lunde from Western Growers, Kay Pricola from Imperial Valley Vegetable Growers and Sonia Tighe from Florida Fruit and Vegetable Association 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

Name	Business	State
Tony Catanzariti	A&S Catanzariti	South Australia
Ben Walter	Thomas Foods International Fresh Produce	South Australia
Craig Dingle	Kalfresh	Queensland
Liam West	Kent's Produce	Queensland
Brendan and Janne Dipple	Bare Essentials	Queensland
Nikki Keyte	One Harvest	Queensland
Samantha Ellen	One Harvest	Western Australia
Bernie Prins	Simplot	Tasmania
Dimi Kyriakou (Tour Leader)	AUSVEG	Victoria

Appendix 2: Itinerary

Day 1 Saturday 3 February 2018	**Australia – Los Angeles, California** **11.15am:** Participants depart Melbourne on Qantas Flight QF93. **11.20am:** Participants depart Brisbane on Qantas Flight QF15. **6.00am:** Brisbane participants arrive in Los Angeles. **6.35am:** Melbourne participants arrive in Los Angeles. **10.10am:** Connecting flight to Phoenix, Arizona on American Airlines Flight AA1271. **1.02pm:** Arrive Phoenix. On arrival in Phoenix we will be transferred to the hotel. Spend the afternoon resting and exploring before a group welcome dinner and briefing in the evening. **Accommodation:** Wyndham Garden Phoenix Midtown 3600 N 2nd Avenue Phoenix, AZ 85013 Phone: +1 (602) 604-4900
Day 2 Saturday 4 February 2018	**Phoenix – Yuma, Arizona** **7.15am:** Check out and depart hotel. We will then travel by coach to Buckeye. **8.00am – 10.00am:** Visit Duncan Family Farms, a fourth generation organic growing operation that produces more than 8,000 acres of certified organic baby lettuce, and green kale, beets, chard and herbs. **10.30am – 12.30pm:** Meet the team from Rousseau Farming Company, which was founded in 1892 and grows fruits and conventional and organic vegetables. After lunch, we will drive 2.5 hours to Yuma for a free evening. **Accommodation:** Radisson Hotel Yuma 1501 South Redondo Center Drive, Yuma, AZ 85365 Phone: +1 (928) 783-8000
Day 3 Monday 5 February 2018	**Yuma, Arizona** **8.45am:** Depart hotel. **9.00am – 11.00am:** Meet Chris Rotticci from Automated Harvesting, and see some incredible harvesting equipment for the vegetable industry in action. **1.00pm – 3.00pm:** JV Smith Companies is a food processing company that is dedicated to food safety and innovation. Following the meeting we will travel approximately 20 minutes to our next stop. **3.30pm – 5.30pm:** The Growers Company is a farm labour contractor that will provide an overview of the labour situation in Arizona and immigration policies, as well as current strategies employed by today's modern labour contractor, food safety and managing costs and labour. Return to the hotel for a free evening.

	Accommodation: Radisson Hotel Yuma 1501 South Redondo Center Drive, Yuma, AZ 85365 Phone: +1 (928) 783-8000
Day 4 Tuesday 6 February 2018	**Yuma, Arizona – Imperial Valley, California – Yuma, Arizona** **7.45am (Yuma local time):** Depart hotel and drive approximately one hour to Imperial Valley in California (please note there is one hour time difference between Arizona and California). **8.15am – 9.30am:** Visit Vessey & Co. and see crops of head lettuce, romaine, kale, spring mix, cabbage and cauliflower being harvested. **9.35am – 10.45am:** Meet Scott from Oasis Farms, which grows for Lakeside Organics. Scott grows over 40 crops, from fennel to carrots and leafy greens, and he will guide us to the fields. **11.00am – 12.30pm:** Ralph Strahm will join us and we will tour a nearby carrot field. The Strahm family has Australian connections. **12.30pm:** We will have lunch at the Desert Research Center (and extension service). This will provide an opportunity to discuss research projects with the Executive Director. **1.30pm:** Depart Holtville and return to Yuma. **3.30pm (Yuma local time):** Arrive at hotel. You can enjoy some free time in the afternoon before a group dinner in the evening. **Accommodation:** Radisson Hotel Yuma 1501 South Redondo Center Drive, Yuma, AZ 85365 Phone: +1 (928) 783-8000
Day 5 Wednesday 7 February 2018	**Yuma, Arizona – Orlando, Florida** **5.15am:** Check out and depart hotel. **7.30am:** Depart Yuma on American Airlines Flight AA3160. **8.49am:** Arrive Phoenix, Arizona. **10.08am:** Depart Phoenix on American Airlines Flight AA0567. **4.23pm:** Arrive Orlando, Florida. On arrival in Orlando we will be transferred to the hotel where you can enjoy a free evening. **Accommodation:** SpringHill Suites Orlando/Kissimmee 4991 Calypso Cay Way, Kissimmee, FL 34746 Phone: +1 (407) 997-1300

Day 6 Thursday 8 February 2018	**Orlando – Plant City – Wimauma – Duette – Orlando, Florida** **7.30am:** Depart hotel and drive to Plant City. **9.00am – 11.00am:** Visit Sizemore Farms, which grows strawberries and blackberries on an interesting trellis system during winter. **11.30am – 12.00pm:** We will stop for lunch at the Florida University Gulf Coast Research and Education Centre (GCREC). **12.00pm – 2.00pm:** Tour and visit the GCREC. **2.30pm – 4.00pm:** Visit Lipman Produce, growers of vegetables, tomatoes and citrus. Lipman is a very large vertically integrated operation that not only grows and ships its own product, but also owns repacking facilities and packing houses. Return to the hotel for a free evening. **Accommodation:** SpringHill Suites Orlando/Kissimmee 4991 Calypso Cay Way, Kissimmee, FL 34746 Phone: +1 (407) 997-1300
Day 7 Friday 9 February 2018	**Orlando – Clermont – Umatilla – Mt. Dora – Orlando, Florida** **7.30am:** Depart hotel. **8.45am – 10.15am:** Learn how horticultural businesses can benefit from agri-tourism with a visit to Southern Hill Farms, a family-owned and operated U-Pick blueberry farm. **11.30am – 1.15pm:** Meet Chuck and Vesna Allison from Wild Goose Farms and enjoy a traditional lunch courtesy of the farm. **1.45pm – 4.00pm:** Stop by H&A Farms/Billy Long Packing House, which features a state-of-the-art blueberry packing facility that follows the highest standard of food safety. After returning to the hotel, we will meet for a group dinner. **Accommodation:** SpringHill Suites Orlando/Kissimmee 4991 Calypso Cay Way, Kissimmee, FL 34746 Phone: +1 (407) 997-1300
Day 8 Saturday 10 February 2018	**Orlando, Florida** Rest day. Today you can relax and see the sights of Orlando. **Accommodation:** SpringHill Suites Orlando/Kissimmee 4991 Calypso Cay Way, Kissimmee, FL 34746 Phone: +1 (407) 997-1300

Day 9 Sunday 11 February 2018	**Orlando, Florida – San Francisco – Salinas Valley, California** **3.45am:** Check out and depart hotel. **6.15am:** Depart Orlando on United Airlines Flight UA0759. **9.25am:** Arrive San Francisco, California. A coach will meet us at the airport and we will then drive approximately 2.5 hours to Salinas Valley. Enjoy a free afternoon and evening. **Accommodation** Hampton Inn & Suites by Hilton – Salinas 523 Work Street, Salinas, CA 93901 Phone: +1 (831) 754-4700
Day 10 Monday 12 February 2018	**Salinas, California** **9.30am:** Depart hotel. **9.45am – 11.45am:** Go behind the scenes of Taylor Farms' salad processing facility. **12.00pm – 2.00pm:** Visit the Western Growers Centre for Innovation & Technology where we will have a roundtable presentation/discussion with the agtech residents of the Centre and a working lunch. Return to the hotel for a free evening. **Accommodation:** Hampton Inn & Suites by Hilton – Salinas 523 Work Street, Salinas, CA 93901 Phone: +1 (831) 754-4700
Day 11 Tuesday 13 February 2018	**Salinas – Sacramento, California** **8.30am:** Check out and depart hotel. **9.00am – 10.30am:** Meet Dr Steve Klosterman, a researcher from the University of California, Davis, who will discuss spinach and lettuce production in coastal California, and the pathogenic fungi and oomycetes that impact both crops. Following the meeting we will drive approximately three hours to Sacramento and stop for lunch on the way. You have a free evening upon arrival at the hotel. **Accommodation:** Residence Inn Sacramento Downtown at Capitol Park 1121 15th Street Sacramento, CA 95814 Phone: +1 (916) 443-0500
Day 12 Wednesday	**Sacramento – Modesto – Bakersfield, California**

14 February 2018	**7.30am:** Check out and depart hotel. **8.00am – 11.00am:** Tour the facilities of Bayer Biologics, 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. Following the meeting we will drive 1.5 hours to Modesto. **12.30pm – 2.00pm:** Meet Anthony Ratto from Ratto Bros, a family-owned grower and shipper of around 40 crops including leafy greens and other vegetables. A five acre solar farm has been instrumental in the company's drive for sustainability. After the meeting we will stop for lunch and drive approximately 3.5 hours to Bakersfield where you can enjoy a free evening. **Accommodation:** Four Points Sheraton Bakersfield 5101 California Avenue, Bakersfield, California 93309 Phone: +1 (661) 325-9700
Day 13 Thursday 15 February 2018	**Bakersfield – Tulare – Bakersfield, California** **7.30am:** Depart hotel. **9.00am – 4.00pm:** Today we spend the day at the World Ag Expo in Tulare. This is the world's largest annual agricultural expo, with more than 1,400 exhibitors displaying the latest in farm equipment, communications and technology on 2.5 million square feet of exhibitor space. Return to the hotel and enjoy a free evening. **Accommodation:** Four Points Sheraton Bakersfield 5101 California Avenue, Bakersfield, California 93309 Phone: +1 (661) 325-9700
Day 14 Friday 16 February 2018	**Bakersfield – Los Angeles, California** **9.30am:** Check out and depart hotel. **10.00am – 3.00pm:** Today we visit the fields and facilities of Bolthouse Farms, one of the leading carrot producers and packers in the United States. This is a very large scale operation, and the visit will take most of the day. Following the meeting we will drive approximately 2.5 hours to our final stop in Los Angeles, where we will have a final group dinner and farewell. **Accommodation:** Holiday Inn LAX 9901 S. La Cienega Boulevard, Los Angeles CA 90045

	Phone: +1 (310) 649-5151
Day 15 Saturday 17 February 2018	**Los Angeles, California – Australia** Today we have a free day in Los Angeles before our evening flight back to Australia. **11.20pm:** Brisbane participants depart Los Angeles on Qantas Flight QF16. **11.35pm:** Melbourne participants depart Los Angeles on Qantas Flight QF96. **7.15am:** Brisbane participants arrive on Monday 19 February (local time). **10.10am:** Melbourne participants arrive on Monday 19 February (local time). Please refer to your itinerary for any connecting flight information.

Appendix 3: Social media coverage – Facebook