

# **Hydroponic Farmers Federation NZ Greenhouse Study Tour**

Tony Spurling  
Hydroponic Farmers Federation

Project Number: VG09163

## **VG09163**

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FINAL REPORT  
PROJECT NUMBER – VG09163

HYDROPONIC FARMERS FEDERATION NEW ZEALAND GREENHOUSE STUDY  
TOUR – APRIL 2010

Tony Spurling

Vice President – Hydroponic Farmers Federation

## VG09163 – Hydroponic Farmers Federation NZ Greenhouse Study Tour – April 2010

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Purpose: The purpose of this study tour was to observe how New Zealand's greenhouse growers have taken Dutch techniques and technologies and implemented them in the southern hemisphere, under New Zealand conditions. By studying these first hand, tour participants hope to take away the tools to improve their own growing situations.

Government Priority: Productivity and adding value.

Funding Source: Horticulture Australia Limited

Date of Report: June 2010



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## **Tour Participants**

Graeme Smith – Graeme Smith Consulting

Anthony Brandsema - J & A Brandsema Pty. Ltd

Marcus van Heijst – Powerplants Pty Ltd

Jenny Earles – Jindivick Hydroponics

Lee Earles – Jindivick Hydroponics

John Elford – Yendon Gourmet Tomatoes

Bev Horne – Golden Triangle Hydroponics

Jeff Horne – Golden Triangle Hydroponics

Steven Moore – EE Muir & Sons

Michael Tran – EE Muir & Sons

Scott Elliot – Harcourt Hydroponics

Andrew Grieves – Top Caps

David Zalsman – Zaldeesh PtyLtd

Joshua Curry – Curry Flowers

Jeremmy Bitmead – Curry Flowers

Annie Hart – Casetech Pty Ltd

Debbie Spurling – Gateway Hydroponics

Tony Spurling – Gateway Hydroponics / Hydroponic Farmers Federation

## **Summary**

This study tour allowed us to view firsthand the highly efficient New Zealand growing methods and glasshouse systems that have been developed. The Australian protected cropping industry largely emulates the Dutch model in terms of growing techniques and technology, therefore we assessed their approach to greenhouse crop management, with particular emphasis on their growing techniques and adoption of new & emerging technologies.

Growers are sometimes reluctant to adopt new technologies without the opportunity to investigate first hand their operation and maintenance. This tour offered a unique opportunity to assess their integration into their own systems.

Better informed growers have the capacity to up-skill the entire industry through technology transfer to others via grower workshops and industry publications.

Industry benefits are that access to information on the latest growing techniques and technology underpin industry development & growth. Production and quality increases are necessary to meet the increasing demands of QA systems for both domestic and export markets. Industry skilling has the capacity to meet these needs and match the standards of the competitive imports/exports. Overseas study is mandatory if we are to match production standards with overseas competitors as well as up-skilling the industry resulting in enhanced productivity and farm viability

## TOUR ITINERARY

**Sunday 18<sup>th</sup>:** Flight EK406 Departs Melbourne 0715. Arrives Auckland 1245.  
Transfer to Stamford Plaza Auckland.

### **Monday 19<sup>th</sup>:**

0745 Depart hotel for farm visits.

0900 **Southern Paprika – WARKWORTH - Capsicums**

1130 **Seth Laarakkers – HELENSVILLE - Capsicums**

1330 Lunch on the road.

1545 **Van Lier Nurseries – MASSEY - Roses**

Transfer to overnight accommodation a Whangaparaoa Lodge Motel, Little Manley Beach.

### **Tuesday 20<sup>th</sup>:**

0745 Depart hotel for farm visits.

1000 **Exception Ltd – PUKEKOHE - Telegraph Cucumbers**

1200 Lunch on the road

1330 **Bruce Nichols – PUKEKOHE - Lettuce**

1530 **Freshwest – WAIUKU - Chilies, capsicums**

The grower manager of Freshwest had gone hunting for a week, so his greenhouse consultant, Marien van der Eijk led the greenhouse tour of Freshwest.

1700 **Faber Glasshouse - Glasshouse manufacturer**  
BBQ dinner provided by Faber

Transfer to accommodation at Novotel  
Ellerslie, 2 nights.

**Wednesday 21<sup>st</sup>:**

0745	Depart hotel for farm visits.	
0830	<b>Gellert Nursery – KARAKA -</b>	<b>Seedling &amp; plant nursery</b>
1015	<b>Joshua Cymbidium - DRURY</b>	<b>Cymbidium orchids</b>
1200	Lunch on the road	
1330	<b>Trotters Nursery – KARAKA -</b>	<b>Seedling nursery</b>
1530	<b>Bernie Kay – RAMARAMA -</b>	<b>Gerberas</b>

**Thursday 22<sup>nd</sup>:**

0745	Depart hotel for farm visits.	
0830	<b>Status Produce – MANGERE -</b>	<b>Tomatoes</b>
1045	<b>Crop Solutions Ltd – PUKEKOHE -</b>	<b>Biological pest control</b>
1400	<b>Flat-tac – WAIKATO -</b>	<b>Capsicums</b>

Transfer to accommodation in Rotorua; Duxton Hotel Okawa Bay

Hangi dinner and Maori cultural performance at Rainbow Springs.

**Friday 23<sup>rd</sup>:**

0745	Depart hotel for farm visits.	
1030	<b>Rianto Ltd. – WAIKATO -</b>	<b>Tomatoes</b>
1300	Study tour concluding lunch. Simunovich Olive Estate.	

Group transfers to Auckland International Airport

EK407:                      Departs Auckland 1745.                      Arrives Melbourne 1945.

Southern Paprika, Walkworth, Capsicums  
Stuart Attwood, [stuart@southernpaprika.co.nz](mailto:stuart@southernpaprika.co.nz),

Southern Paprika's greenhouses cover 15 hectares in total, however the site we visited was 4 Hectares. Capsicum plants here are grown in a Coco Peat medium on hanging gutters, and normally yield 25 to 30 kg per square meter. The greenhouse is heated using natural gas, and Stuart says that it is quite expensive to run, however he does reap the rewards of increased production due to the ability to harvest CO<sub>2</sub> from his natural gas boiler which is used to increase CO<sub>2</sub> levels in his greenhouse, which increases fruit size and production. A heat storage facility is used to facilitate CO<sub>2</sub> production during the day, with the boiler heat produced stored in 3 large insulated water tanks which are drawn down for heating at night and on cold days.

Potato Psyllid, Thrips and Aphids are the biggest pest problems experienced in this greenhouse. Thrips and Aphids have been controlled in the past by using predators. The Potato Psyllid is a recent incursion into New Zealand, and has thrown the New Zealand greenhouse industry into some significant turmoil. This Psyllid is the vector for an infection called Liberbacter, which can have a devastating effect on both Tomato and Capsicum crops. No effective biological (predator) control has been established for this Psyllid, so insecticides have to be applied to control it. This has had the unfortunate side effect of rendering biological control of Thrips and Aphids impossible, as the insecticides used to control Psyllid will kill the predators used to control Thrips and Aphids. As a result, Thrip and Aphid numbers have been increasing since the Psyllid incursion. Thrips are a common vector for a number of plant diseases, and one of these, Spotted Wilt Virus, has become a significant problem as a result of increasing Thrip numbers, not only in his greenhouse, but in his seedling propagators greenhouse. Stuart has now taken to propagating his own seedlings to ensure a virus free seedling crop.

Southern Paprika recycle their irrigation / nutrient run-off, and use a combination of Ultra Violet and Ozone sterilization to eliminate water borne pathogens in their run-off water.



Southern Paprika's packing house was bigger than many tour participants' greenhouses.

Seth Laarakkers, Helensville. Capsicums  
Seth Laarakkers, sethlaarakkers@xtra.co.nz

The Laarakkers family glasshouse covers 1 Hectare, Capsicum plants here are grown in a Rockwool medium on hanging gutters, and normally yield 25 kg per square meter.

They grow for New Zealand Gourmet, who export their capsicums to Japan. As NZG provide grading and packaging service, they have no pack-house on site. Their fruit normally packs out to 97% first grade at NZG. They grow a variety called Special, which has an exceptionally long shelf life, so long in fact, that these capsicums can be sea freighted to Japan without compromising quality.

They recycle their irrigation / nutrient run-off, and use Ozone sterilization to eliminate water borne pathogens in their run-off water.

They too propagate their own seedlings, sowing into Rockwool and germinating the seed in a heated shipping container. From here they transfer the seedlings into a fairly primitive heated tunnel house to grow out. Close inspection of the established plants in their glasshouse shows that the seedlings produced in this very basic nursery were of a high standard. The fact that they produce 25 kg per square metre of 97% first grade fruit from these plants is testament to this.



Laarakkers very basic seedling nursery produced a first grade crop of seedlings.

Van Lier Nurseries. Massey. Roses  
Theo Van Lier. sales@vanlier.co.nz

Van Lier Nurseries operate 2 sites, the site visited by the group was a 9000 square metre Faber glasshouse.

Van Lier grow roses in pumice, using a recirculating hydroponic system, cleaning and sterilizing their run-off water using a 48 cubic metre sand filter and low pressure Ultra Violet sterilizer. They use a 4 Megalitre lined basin for water storage.

Two Spotted mite and Aphids are the biggest insect pest problems at this establishment. Because they are not producing food products they don't see the point in using biologicals (insect predators) for pest control. They do have to take tremendous care in pesticide selection when treating pest outbreaks however, to avoid pesticide resistance problems. This can be easier said than done at some times of the year, as weekly sprays are sometimes required during summer to keep mites under control. Inspection of the rubbish bin in their fertigator room revealed over a dozen different kinds of insecticide and miticide in use (I'm sure there were more than this, but didn't want to go digging in the bin)

The greenhouse is heated using natural gas, and they harvest CO2 from the natural gas boiler which is used to increase CO2 levels in his greenhouse, this increases bloom size and production. A heat storage facility is used to facilitate CO2 production during the day, with the boiler heat produced stored in a large insulated water tank which are drawn down for heating at night and on cold days.

90% of their flowers go to 2 market auctions, next year 80%.



Exception Ltd, Pukekohe, Telegraph cucumbers  
Arie van der Houwen, [arie@nzcucumber.co.nz](mailto:arie@nzcucumber.co.nz)

Exception's glasshouse comprises 3x 7000 square metre compartments. Two of the compartments were planted into coco peat, and the third into a mixture of sawdust and pumice. By using three greenhouse compartments, and staggering plantings, this facility is always in production. They normally grow 3 ½ crops per year across the three compartments, and it was evident that they placed great importance on greenhouse hygiene. The paths and plant rows were very clean, neat and tidy. Integrated Pest Management plays a major role in insect and mite control, with biologicals used to manage Whitefly, Two Spotted Mites and Thrips. They use sulphur on their floors and select mildew resistant varieties to control Powdery Mildew rather than relying on fungicide sprays. Another interesting pest management tool in use was a cat, which lives in the greenhouse and controls the mouse population. I wonder what his Q.A. / HACCP auditor would think if he saw that?

The greenhouse is heated using natural gas, and they harvest CO<sub>2</sub> from the natural gas boiler which is used to increase CO<sub>2</sub> levels in his greenhouse, which increases fruit size and production. A heat storage facility is used to facilitate CO<sub>2</sub> production during the day, with the boiler heat produced stored in large insulated water tanks which are drawn down for heating at night and on cold days.

They recycle their irrigation / nutrient run-off, and use Ultra Violet sterilization to eliminate water borne pathogens in their run-off water. Arie says that if he were to set up again, he would use Ozone instead of UV sterilization, as he is tired of the time and expense required to maintain his UV system.

This was the only greenhouse on the tour which included greenhouse cooling. A grid of sprinklers were set up on the greenhouse roof, which are turned on on very hot days, and have the ability to drop 3 or 4 degrees out of the greenhouse.



Compartment 3, all 3 compartments at Exception Ltd. were spotlessly clean.

Bruce Nicholls, Pukekohe. Lettuce  
Bruce Nicholls, 09 238 9733

The Nicholls' have been operating from their Adams Rd. site for 30 years, and I suspect that some of their structures have been in place for a good part of that.

All of the lettuces are grown in Nutrient Film Technique and the growing areas here are mostly open ended igloos, although a couple of areas were fully enclosed. None of the growing areas are heated, and many had damaged roof covers, exposing the crop to the elements. Some areas also had many weeds.

The lettuces produced here are a credit to the Nicholls', even with the unsophisticated growing systems and environment, the quality of their produce was excellent. When setting up NFT systems, everyone you speak to will tell you that you have to set up your NFT channels to precise tolerances to get the right water flow through them. Without this we are told, good quality is difficult to obtain. The NFT channels here were "all over the place", and still producing great quality.

It was really interesting to see what can be achieved even with the most basic facilities.



Despite some missing walls and covers, varying channel angles, weeds under benches etc. Bruce Nicholl produced a very high standard of produce.  
(No-one was sure why the pumpkin was on the end of the bench!)

Freshwest. Waiuku. Chilies / Capsicums  
Gaven Naylor, [freshwest@xtra.co.nz](mailto:freshwest@xtra.co.nz)

The Naylor's operate a 7000 square metre polyethylene clad Redpath greenhouse producing smaller "snacking" capsicums and chilies, planted out in Coco peat. They use their Coco peat media for 2 seasons.

They value add to much of their produce, flow-packing or bagging it before dispatch directly to supermarkets. One line of smaller capsicums is marketed under the "little sweetie" brand, with superior taste and colourful packaging this product commands a price premium. A considerable investment was required however in packaging equipment. They employ around 10 staff, which at first seemed excessive, however the premium prices they receive due to their value adding activities and very high quality they achieve in the greenhouse more that covers the extra cost of employing all these people.

The greenhouse is heated using a coal fired boiler, so CO2 supplementation is not possible here.

Integrated Pest Management is employed to deal with major greenhouse pests.



High quality produce and high quality presentation secure a price premium for Freshwest.

Faber Glasshouse, Waiuku, Glasshouse builder  
Leo Faber, [faber@faber.co.nz](mailto:faber@faber.co.nz)

Faber Glasshouse operate a huge facility, and have invested heavily in state of the art manufacturing machinery. This includes a number of robots and a very impressive CNC machining centre which can perform many machining functions with amazing accuracy.

Leo Faber showed us the latest gutter profiles which provide extra strength in a smaller profile, and also include a condensation trap to eliminate condensate dripping onto plants. Also showed us a new sandwich panel design which they propose using as an insulating roofing material in packing and plant room situations. This new innovation has the potential to reduce construction costs considerably in new glasshouse projects. They also have a new double span truss under development which will increase clear-span area in packing houses and plant rooms.



One of Faber Glasshouses robots.

Gellert Nursery. Karaka. Seedling nursery  
Steve Gellert, [steveg@gellerts.co.nz](mailto:steveg@gellerts.co.nz)

Gellert's Nursery was probably the most impressive facility which the group saw during the greenhouse study tour. The facility covered 2 Ha, with 15,000 square metres dedicated to greenhouse seedling production, and the balance in ornamental plant production, primarily Phalanopsis and Bromiliads.

Hygiene in the seedling production area was fastidiously maintained, this included staff hygiene as well as growing areas. With the threat of plant diseases vectored by Thrips (Spotted Wilt) and the newly discovered Psyllid (Liberbacter) ever present, and so much riding on the quality of the seedlings produced at this facility; this eye for detail is critical.

They use a "seedling spacing machine" to spread the seedlings out in their growing areas. This machine picks up 600 seedlings at a time, and automatically places them back down on the floor at perfect intervals and spacings. The machine cost 160,000 Euro to purchase, and they had budgeted on a payback period of five years, however the machine has been so successful that the payback was actually three years, over employing people to manually move and space plants.

The majority of seedlings produced here are grafted, to provide extra power to plants, and or to improve resistance to various media / water borne pathogens (Fusarium etc) The root stock and top stock are cut at a 45 deg angle, by one crew, the grafting clips are installed by another crew and then the top stock is fitted by the original crew. Instead of using two top stocks in double headed plants, they "pinch" the tops out of the plants after the first true leaves, which encourages strong lateral growth.

They recycle their irrigation / nutrient run-off, and use 15,000 litre/hr Low Pressure UV sterilization to eliminate water borne pathogens in their run-off water.



Left: Steve Gellert demonstrating the rolling bench system in his potted plant house.  
Right: The "seedling spacing machine" which paid for itself in 3 years instead of 5.

Joshua Cymbidium, Drury, Cymbidium orchids  
Joe Sonnevled, [joe@joshua.co.nz](mailto:joe@joshua.co.nz)

Joshua Cymbidium operate an 8500 square metre Polyethylene film clad greenhouse, and grow primarily for Japanese and U.S export.

Plants have a 10 year or more life span, so greenhouse hygiene is critical to keep the plants healthy for these extended periods. Tobacco Mosaic virus is the biggest threat to plant health. In some parts of the greenhouse each plant has its own pruning knife which is stored in its own pot of sterilizer. Each knife is used only on that plant and then replaced in the sterilizer so that no viruses or diseases can be transmitted from one plant to another. This level of care appears to extend to every aspect of Joshua's operation. The greenhouse path and plant rows are spotlessly clean, as are the greenhouse walls and exterior surroundings. Every flower spike on every plant is carefully positioned and often supported to ensure perfect, unmarked blooms.

They have even installed a plant transport system from the greenhouse to the packing area to ensure that each flower spike arrives at the packing area in perfect condition; this system also makes life easier for picking staff, who do not have to manually carry large bundles of flowers around.

Mites, scales and thrips all cause problems in this greenhouse, and IPM is employed for pest control. Many insecticides can be harsh on delicate flowers, and compromise bloom quality, so spraying is always a last resort for pest control.

Joshua Cymbidium grows 20 different varieties of Orchid. Demonstrating their eye for detail, they run 12 different feed recipes through 24 irrigation valves to maintain optimum plant health and quality in each variety!



Attention to detail is evident with the spike supports (left) and spotlessly clean greenhouse (right) note overhead rails used for greenhouse flower transport system.

Trotters Nursery, Karaka, Seedling nursery  
Dean Hancock, 09 291 9100

Trotters Nursery caters for the “Budget End” of the greenhouse seedling market, and typically charges around 80 to 90 cents per seedling. The owner tells us that this is a shrinking market however, populated by 20 – 30,000 sq. feet immigrant growers. Grower numbers have declined from in the order of 1500 to around 250 in the last ten years, and the majority of growers who are left operate larger, more sophisticated greenhouse systems. These growers require a larger seedling in a rockwool block, and are prepared to pay around \$1.60 for a Tomato seedling from the likes of Gellert’s.

Whitefly and Thrips are the biggest problems here, however at 80 to 90 cents per plant they can’t afford to use IPM, and instead employ a Low Volume Mister and a range of pesticides.



Trotters “basic” seedling nursery satisfies the needs of the budget end of the greenhouse seedling market.

Bokay Flower Farms. Ramarama. Gerberas  
Bernie Kay. [patberniekay@xtra.co.nz](mailto:patberniekay@xtra.co.nz)

Bokay Flower farms was founded in 1980, and grow in 13,340 square metres of heated greenhouses using a media blend of 50% coir / 50% pumice. Uses waste oil to fire his Hydronic heating system. New Zealand are about to introduce an Emissions Trading Scheme which will impose new costs of around \$43,000 per year onto his business. Bokay sell their blooms through the local auction system, so this is a cost which cannot necessarily be passed on.

Irrigates based on time rather than the more usual radiation sum, and has some botrytis issues. One of the flower growers on the tour suggested that these may be related.



Bokay Flower Farms produce 87 different varieties of Gerbera

Status Produce. Mangere. Tomatoes  
Leon Stiglingh. 64 9275 1819

Status Produce operates a 4.2 Ha glasshouse site in Mangere, planted out to Tomatoes in rockwool. At the time of this visit, the crop had been topped, and had around one month to go before finishing. It is an urban site, and suffers some challenges as a result. Rates on the site are over \$100,000 per year for starters, and as an urban site, they have residential neighbours to contend with as well.

Status are one of the bigger “Corporate” growers in New Zealand, and this was evident by the way they monitored and controlled their greenhouse labour, and managed their crop.

Their picking varied from taking loose tomatoes (with the calyx off, it costs 6 cents / kg more to pick with calyx on) to picking trusses, depending on market conditions.

It was telling to note that although their greenhouse staff are paid by the hour, they are expected to meet “plants per hour” targets.

These included:

- De-leafing – 1100 plants/Hr
- Layering – 750 plants/Hr
- Clipping – 2000 plants/Hr
- Truss pruning – 2200 plants/Hr

They do run a bonus system, which is controlled and monitored using their Priva Assist labour monitoring system.

Main insect problem is Psyllid, Psyllid nymphs and possibly adults inject a toxin into the plants when they feed on them. The toxin causes discolouration of leaves and the plant to become stunted exhibiting ‘psyllid yellow’ and ‘purple top’. Leaf edges upturn and show yellowing or purpling. The plants internodes shorten and new growth is retarded. Evidence of Psyllid feeding, and these symptoms were evident on many plants in the greenhouse.

They use a new product called Vertikill, to control Greenhouse Whitefly. This new product is an “Entomopathogen”, in simple terms a fungus. This fungus attacks all stages of Whitefly, and having used this product for some time, Status had almost complete control of their Whitefly population, (I do say *almost* complete control, as very low Whitefly number were evident in the greenhouse, however not at pest levels)

They recycle their irrigation / nutrient run-off, and use Ultra Violet sterilization to eliminate water borne pathogens in their run-off water. Leon says that if he were to set up again, he would use Pasteurization instead of UV sterilization, as he is tired of the time and expense required to maintain his UV system.

Crop Solutions. Pukekohe. Biological pest control  
Stephen Ford. [stephen@millenniummicrobes.com](mailto:stephen@millenniummicrobes.com)

Crop solutions have developed a number of Entomopathogens, fungus which attack and kill some insects. To date they have developed products which control Greenhouse Whitefly, and which they claim can control Thrips. They are currently investigating moving into the Australian market, which is very exciting news indeed as this technology has much to offer Australian growers. We saw their Whitefly product in action at Status produce, and if they can reproduce these results in Australia they will win a lot of friends here.



Silverleaf Whitefly nymph infected with entomopathogenic fungus, *Paecilomyces fumosoroseus*

Photograph by: Heather McAuslane, University of Florida

Flat-tac. Waikato. Capsicums

Gail and Matthew Jelecich [gail@capsicum.co.nz](mailto:gail@capsicum.co.nz)

Flat-tac operate a 5000 square metre poly. House, growing capsicums in an NFT system.

This was the neatest, cleanest crop viewed during the whole study tour, and it was obvious that the owners took great pride in their work and the quality they produced, and this pride had rubbed off on their staff. The standard of capsicums produced here is so high that they receive a \$1.50 premium over market price for their fruit.

The quality they attain has nothing to do with any high tech gadgets, fancy control systems or new innovative growing techniques. On the contrary, they use LPG hot air blowers instead of the industry standard Hydronic Pipe rail system, they don't use CO2, they run a basic Priva controller, and use manually operated ("bump along") crop trolleys which run along the floor instead of hydraulic pipe rail trolleys. Yet despite all of these "quirks" they produce this amazing fruit. The reason for this is that Gail and Matthew are great growers, and they have the basic growing down to a fine art. Every detail of their system and their growing is meticulously monitored, maintained and managed. Their pruning and crop work is performed with a fanatical eye for detail. Their Integrated Pest Management program is run the same way. And because Gail and Matthew work in their crop along side of their workers, they know exactly what is happening all the time, and they're on top of problems before they become problems.



Left: Warm air heating duct positioned between NFT channels.

Right: "Bump along" crop trolley.

Rianto Ltd. Waikato. Tomatoes  
Jeff van Rijen. jeff.rianto@xtra.co.nz

Rianto have worked from their Waikato site for 25 years, and a second generation of the Van Rijen family now manage their glasshouse. They heat their 1 Ha glasshouse using waste oil, and burn LPG to produce CO<sub>2</sub>. They grow tomatoes in rockwool, and are the only grower we met on the tour who re-uses his rockwool growing media. Every season they remove their rockwool from the greenhouse and steam it to kill all the old roots, and any bugs or pathogens there-in. In this way, they can re-use their growing media for 4 or 5 seasons.

They loose pick only without the Calyx, and go through the greenhouse to remove empty truss stems periodically to prevent botrytis. Varieties grown are Tresco, grafted onto Emprador, and Comet also grafted onto Emprador.

They recycle their irrigation / nutrient run-off, and use Ultra Violet sterilization to eliminate water borne pathogens in their run-off water.

They too use the Whitefly fungus “Vertikill” to control whitefly. To maintain control he finds that he need to apply the product weekly during summer, and reducing to monthly during winter. Psyllid are their biggest problem, however there was no obvious evidence of Psyllid yellows or other symptoms in the crop. All of the work performed in the Rianto greenhouse was completed to a very high standard, crop work appeared faultless and workers appeared to take a lot of care in the completion of their tasks. As was the case with Flat tac, Jeff Van Rijen leads by example, and spends a lot of time in his greenhouse working along side his staff, and keeping his finger on his crops pulse.



Left: Plant work was completed to a very high standard.  
Right: Jeff Van Rijen shows the group a very clean root zone.

## **Tour Outcomes**

The tour group was fortunate to experience a wide variety of experiences in a relatively short time frame.

Ours is a strongly technology driven industry, however while traveling around New Zealand visiting their greenhouses, I realized that in terms of technology they are really not that far ahead of Australian growers. And in many cases, actually lack some of the greenhouse features which many Australian growers take for granted, such as shade screening and fogging. When one considers however that the temperature rarely gets above 28 degrees in the region we visited, or indeed in much of New Zealand, this is understandable, but highlights one of the main reasons that New Zealand growers consistently achieve higher quality and productivity outcomes than their Australian counterparts. Put simply, their growing conditions are much milder than those encountered in Australia. Growing in Australia is a constant battle with the elements, one which many New Zealand growers were horrified to hear about. To encounter plus 30 degree days over there is very rare, to encounter 7 days on end of plus 30 degrees in Australia is becoming commonplace.

It is important to realize that basic principles still apply. (In terms of plant physiology and environmental management). Australian growers are yet to fully comprehend the growing basics and maybe should concentrate on these before necessarily investing in expensive equipment that possibly will not improve production or quality if not used well.

The one thing which really stood out to me through this whole experience has been that it was not the biggest, best, most high tech. greenhouses which had the best crops, it was the greenhouses with the most dedicated growers. It was the growers who spent their time in their greenhouses, with their plants and their staff. This should be the message to take away from this study tour; Get the basics right, and really understand your greenhouse, your plants and your staff. You will reap more rewards from this than throwing hundreds of thousands of dollars into technology.

## **Suggestions for leaders of future study tours**

Every three days or so, the participants shared with the group their experiences and what 'take-home' message they had discovered and would implement in their own greenhouses. This group discussion was included to enhance their learning experience and improve the quality of their tour experience.

It was very clear from the start of the tour that obtaining access to the best New Zealand growers was almost impossible unless you had an appointment that only major companies (like seed and equipment suppliers) could facilitate. Normal greenhouse access was restricted due to the threat of disease spread and prior arrangements were always necessary. Do your homework before you travel. Also remember that the biggest growers are not always the best, try to see a range of growers, greenhouse and system types and crop types. Big, small, old and new, they all have something to offer, and can throw up some surprises.

Whilst New Zealand distances are relatively short, cross-town traffic in the Auckland region can be a nightmare at rush hour. This can greatly affect road travel times and reasonable allowances should be made when planning routes. Growers are happy to welcome us into their greenhouses (provided prior arrangement made), but do not appreciate late arrivals as each & every day in the greenhouse is a busy one.

## **Technology Transfer**

The learned outcomes of this tour have been and or will be presented at a number of industry association meetings including the following:

Misc. presentations to Victorian Hydroponic Farmers Federation Grower Meetings.

Articles in the newsletter of the Hydroponic Farmers Federation in Victoria

## **Published Article**

HYDROPONIC FARMERS FEDERATION  
NEW ZEALAND GREENHOUSE STUDY TOUR  
MONDAY 19<sup>TH</sup> APRIL – FRIDAY 23<sup>RD</sup> APRIL 2010

A GROWERS PERSPECTIVE  
BY: ANTHONY BRANDSEMA

### **Introduction**

I was asked to write this report as a grower's perspective. The views expressed within this report are my own. Any person wishing to base decisions on changing their operation must do so carefully and not by taking the information written within this report as conclusive, but merely as observations. I will address subjects which I'm compelled to write about, particularly with the view to address issues in my own operation.

### **Growers & Labour**

All the growers and owners of the operations visited were very hospitable and open and free with their information. Approximately half of the growers were immigrants or their descendant. The remainder was comprised of corporate or family based operations from young to the next generation growers. Most were passionate about their business and made an effort to present an operation as something they were proud of.

Most of the smaller operators worked in the crop along side the hired staff, therefore expressing an understanding of the duties performed and sympathizing with the need to rotate jobs to avoid boredom and to retain staff. Of the corporate grower, it appeared that the duties performed were more of a labour management role, based on feedback relayed via crop monitoring, crop workers, supervisors, pack house managers and indeed board members.

Labour sourcing stories varied nearly as often as the number of operations visited. Some directly sourced labour from the local environs, others through contract labour companies, while others directly employed labour from other island countries and organized their working visas and immigration department requirements.

Labour control also varied depending on the site. The corporate grower seemed more concerned with achieving a minimum requirement for each week based on crop work being performed by number of stems visited per hour or harvesting by kilo and being paid by piece rate. It seemed that there was a need to adhere to set times and numbers to help maintain the budgeted figures, "Cost 6 cents /kg more to pick with calyx on". Status Produce, demonstrates the watching of every cost incurred. Priva assist was used as the tool for monitoring the labour movements. The smaller, non corporate grower was more concerned with the quality of the work to be performed. The grower wanted to retain well trained staff, which for them would lead to better staff satisfaction, ownership of the crop and less time to be invested in re-training if staff turnover was high.

## **Technology**

There was a mix in the type of greenhouse structures used. Most structures visited were commercially produced structures which generally would have been less than 15 years old. Each grower knew the advantages and disadvantages of the structure they had to work with, but had adapted their growing to the unique character of their structure. There was a considerable area of glasshouse, mainly on the properties of the corporate operations, but also smaller glasshouses for the smaller and family operators. The glasshouses came from a range of suppliers, local and Dutch. Some were as high as 6m to the gutter. Some of the smaller area growers had locally produced Harford or Redpath poly greenhouses. It surprised me to see how long the growers in poly left their greenhouse covering on for before changing, up to 12 years!

All of the operations visited recycled their nutrient solution. There were several ideas expressed over sterilization with most using Ultra Violet light treatment. Some suggested that the use of Ozone would be considered if given the choice, with one grower wanting to look at pasteurizing.

All growers visited used heating for their greenhouse. Heating equipment varied from natural and LP gas to recycled oil burning, with most using CO<sub>2</sub> from the gas burner. Most gas boiler based systems used a buffer tank.

The Gellert nursery invested heavily in equipment, Euro160,000 for a machine dedicated to laying out plants, spacing and picking them up again from the nursery floor. The investment made for labour saving.

Grading equipment technology varied from high tech, computerized colour and size grading to simple mechanical weight grading. There was an emphasis in some operations on pre-packing produce, which meant expensive wrapping machines.

## **Market / Export**

There was a mix, proportional to the size of the operation as to where the produce was destined for. The larger operators sell a majority of their produce in the Japanese and Australian export market with some produce staying in New Zealand while the smaller operations sent their produce to the central market, via relationships with the supermarkets or to smaller corner shops and restaurants. Second grade produce from the exporting operations usually sold locally for half of the market price. Some were producing for niche markets with pre-packed produce, entertaining small planting areas of many types of varieties for these niche markets.

Each of the larger exporting operators indicated a frustration with MAFF, New Zealand Agriculture Government Department. They expressed the need for, different policies including tighter quarantine monitoring at the entry points to New Zealand as they had recently suffered a number of insect pest incursions. A reaction by importing countries is to immediately stop import of produce from a country which declared an exotic incursion so to limit the risk of importing the very same pest. This has devastating consequences for the operator of a large exporting business. The market is closed, almost instantly, produce is dumped, crops are pulled out and measures are developed to re-enter the market as quickly as possible. Sometimes the market will not be re-gained. Those operators conferred that the Australian bio-security laws were perhaps designed to better protect the Australian grower as demonstrated by the reluctance by Australia to allow the entry of apples from New Zealand.

## **Conclusions**

New Zealand has a population of (only), 4.4 million people; therefore the push to export is prevalent. New Zealand growers, not limited to greenhouse growers, have good soils, good climate, ample water, (usually) and a well recognized brand. Reliance on an export market can have its issues, of which meeting specifications may only be a small part in the range of issues. One grower visited, namely Gellert's Nursery decided to produce for two different segments, therefore not relying on one industry and having all of his "eggs in one basket". A few dot points can summarize my experience:

- Bigger demand does not mean the better the grower.
- Look at ways of not having all eggs in one basket, including markets
- Australia has a good bio-security protocol; we need to work hard to maintain it.
- Prepare for the world of emission trading schemes.

## **Acknowledgements**

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- Fellow participants of the tour
- All the host operators.
- Marcus Brandsema
- Jillian Brandsema

**Budget**

Macedon Ranges Travel Service

Air Travel, Accommodation, coach hire & Insurance \$33,825.00



## PARTICIPANTS SURVEY RESULTS

<b>1</b> <b>Strongly</b> <b>Disagree</b>	<b>2</b> <b>Mostly</b> <b>Disagree</b>	<b>3</b> <b>Agree</b>	<b>4</b> <b>Mostly</b> <b>Agree</b>	<b>5</b> <b>Strongly</b> <b>Agree</b>
(Please circle most appropriate answer!)				

Study tour met my expectations	1x agree	1x mostly	6x strongly agree
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I received suitable information prior to the study tour	2x agree	1x mostly	5x strongly agree
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Grower visits met my expectations	1x mostly	7x strongly
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Transport arrangements met my expectations	1x agree	7x strongly
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Accommodation arrangements met my expectations	2x mostly	6x strongly
------------------------------------------------	-----------	-------------

The Tour Leader met my expectations	1x mostly	7x strongly
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I would recommend future study tours to other growers	8x strongly
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Any general comments re this study tour

Could have spent another night in Auckland shopping/sightseeing instead of going to Rotorua (it was a bit out of the way)

Great mix of technology and crops, maybe a bit more info on accom. weather, currency, maps etc.

Could have stayed closer to farm venues.

It was enlightening to see that large greenhouses can have the same or similar problems to our smaller ones.

Name: (optional)

Please email or fax completed form ASAP to Tony Spurling  
 Fax: (03) 9739 0568 or [info@gatewayestate.com.au](mailto:info@gatewayestate.com.au)

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*Know-how for Horticulture™*

Tony Spurling

Project Leader