

Pomewest New Zealand Study Tour



Susie Murphy White
Project Manager

Pomewest
January 2018

Acknowledgements:

Thank you to the Agricultural Produce Commission and the Pome sub-committee for funding this project. Without the funding and support from the Agricultural Produce Commission and the Pome sub-committee this study tour would not have been possible. Thank you to the WA Growers who participated on the tour and contributed to the reporting of the project, the in depth questioning at each site visit made for an awesome tour. Thank you to our host consultants from Ag First, their local knowledge and insight on the NZ Pome industry was greatly appreciated. Thank you to all NZ growers, we visited we really appreciated the time taken out their day to speak to us about their orchards. We all loved hearing about their passion for growing good quality fruit.

Disclaimer: All information collected for this report was taken from verbal communication in the orchard. There is no guarantee that statistical information is correct.

Pomewest: 28527 South West Highway Manjimup 6258 Western Australia

Executive Summary

The New Zealand Study Tour project aimed to provide West Australian Pome Fruit growers the opportunity to visit orchards in New Zealand and encourage the transfer of orchard technology.

Nine young orchardists participated in the Study Tour of New Zealand pome fruit orchards. The group visited seven orchards, a pack house and the Plant & Food Research Centre in the Hawkes Bay region on the North Island. They then flew down to the Nelson Region in the South Island to visit one nursery and ten orchards. It was very busy week learning about a buoyant industry that exports more than 90% of their apples and pears.



The tour started with a visit to Plant and Food Research (PFR) in Hawkes Bay learning about the Prevar breeding program. The apples and pears bred through Prevar are available to all Australian growers. So it was good to see their breeding facilities hear about their goals of breeding high flavoured apples, red fleshed apples and pears, fruit with durable resistance traits and the interspecific pears (crosses of European and Asian pears).

We then walked through to the Future Orchards Production Systems (FOPS) trial site located at PFR. Here we meet Ben Van Hooijdonk and Stuart Tustin the plant physiologists who had developed the FOPS planting system. The trial is a 2D planar system aimed at controlling vigour and using light more efficiently and driven by the high cost of land in Hawkes Bay (\$100 000/ha). The narrow row spacing's were at 2m for the Piqa®Boo® pears, Jazz™ apples and 1.5m for Gala apples. All planted with twin stems at 1.35m apart and the vertical fruiting branches trained to be at 30cm apart, so 10-12 uprights per stem. This trial was in its 4th leaf and was expected to yield very well this season; Gala 85 T/ha, Jazz™ 160T/ha and Piqa®Boo® pears 35 T/ha. A very impressive trial to see and then what was more impressive were the NZ growers who were already implementing and adapting the FOPS principles into their commercial orchard plantings. The trials on growers properties had received no funding assistance from outside the orchard business it was just growers having go in their own orchard.

The next training system we saw in both the Hawkes Bay and Nelson regions was the V Trellis. This system costed 50-100% more to construct. More money was being spent on the trellis and rootstocks as the variety on top could be easily changed over using grafting techniques. This gave the life of the infrastructure many more years. Grafting was a very common tool used to keep up with market and consumer demands. It was a quick, easy and cheap way of changing varieties.

We visited Waimea Nurseries Nelson, this is the largest commercial tree nursery in New Zealand. They are the owners of Aztec Fuji® and Lady in Red and members of the International New Varieties Network allowing them to be at forefront of growing new varieties and rootstock development. Their most popular rootstocks they supplied to commercial growers were M9 and CG202 with the varieties requested the most often; Ambrosia, Envy™, Jazz™, Royal Gala (high coloured strains), Lady in Red, Rockit™ and Dazzle™. A recent popular request was the twin stem trees. We saw many new plantings and most of these plantings were twin stems using bench grafts.

Typically the trees in the Hawkes Bay region were tall spindle trees with a very heavy crop load (>100T/ha) that would be able to support high quality apples, as most growers were receiving pack outs greater than 90%. While in the South Island around Nelson growers had focused their efforts on growing 2D systems allowing them to be robot ready. In some cases they were already using platforms to thin, prune and pick.

The New Zealand industry was very focused on exporting to all over the world and not relying on any one market, with their main markets at present Asia, Europe, UK and Americas. Most growers grew many varieties and had a few club varieties on their orchard. On the tour we saw a lot of Envy™, Jazz™, Gala and Braeburn blocks of which are all exported.

The group of young WA orchardists were really inspired by the tour after seeing so many different orchards outside of their own regions. They learnt so much they were keen to come home and try some of the new ideas on their orchard. They showed this enthusiasm by sharing their knowledge gained on the tour at the Pomewest Summit panel discussion.

This project was supported by the Agricultural Produce Commission and Pome sub-committee with growers funding their travel costs. A special thank you goes to the AgFirst Consultants Ross Wilson, Steve Spark and Nic Finger for sharing their knowledge and hosting our group in New Zealand.

'Well, if there are three words I think we can take away from today,

It's scale, precision and passion.'

Contents

Executive Summary	2
Contents	4
New Zealand Pip Fruit Industry	5
Hawkes Bay.....	6
Nelson.....	13
Grower Learnings	18
Evaluation of the Study Tour	24
Appendix.....	28
Budget	33



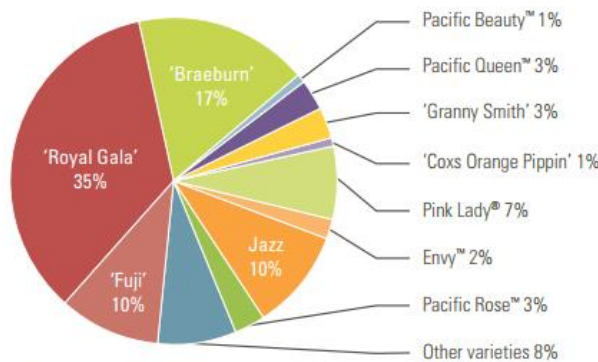
New Zealand Pip Fruit Industry

Agriculture is the main industry in New Zealand and we visited two important growing regions in different microclimates, on both the North and South Islands. New Zealand is home to a population just shy of 4.5 million people, but active export-focused agriculture. In 2017 New Zealand produced the largest apple crop to date 21.5 million cartons worth \$800 million NZD. In four years New Zealand’s apple industry grew from producing 16 million cartons in 2012 to 19.5 million cartons in 2016. New Zealand is making progress to meet the government’s export goal of 1 billion NZD by 2020.

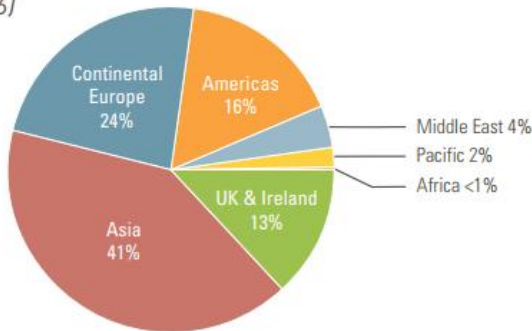
To compete with other Southern Hemisphere exporters like Chile and South Africa, New Zealand are growing premium produce to sell at premium prices. New Zealand is known for taking risks developing and marketing new varieties. Gala and Braeburn were developed in New Zealand decades ago but the country remains on the cutting edge with development of many club varieties such as Dazzle™, JAZZ™, Envy™, Rockit®, Smitten®, and Koru®.

The developing Middle Eastern and Asian markets have created significant opportunities, with sales to Asia making up 40% of total pipfruit exports. Since deregulation the Middle East and Asian markets have grown from 10 to 50 per cent of New Zealand’s trade. Kiwifruit remains the largest fresh fruit export but the apple industry is dynamic and advanced on these two islands between the Pacific and Tasmanian Seas.

Apple exports by variety
(Weight basis, 2016)



Apple export destinations by region
(Weight basis, 2016)



Sources for above charts:
Pipfruit New Zealand Inc.

Apple exports from New Zealand and destinations of New Zealand Apples. Fresh Facts 2016

Hawkes Bay

Hawke's Bay is home to most of New Zealand's apple production. We spent two days in Hawkes Bay with Ross Wilson and Nic Finger, Horticultural Consultants from AgFirst.

Monday Hastings

The tour started with a visit to Plant and Food Research (PFR) in Hawkes Bay learning about the Prevar breeding program. Prevar is the Australian/New Zealand new variety breeding and commercialization program with shareholders from APAL (45%), Pip Fruit NZ (45%) and Plant & Food Research NZ (10%). Current new varieties include; Piqa Fruit (pears), Smitten®, Rockit®, Lemonade®,

Sweetie™, Dazzle™, Cherish™ and Reddy Robbin® (pears). The apples and pears bred through Prevar are available to all Australian growers. So it was good to see their breeding facilities hear about their goals of breeding high flavoured apples, red fleshed apples and pears, fruit with durable resistance traits and the interspecific pears (crosses of European and Asian pears).

We then walked through to the Future Orchards Production Systems (FOPS) trial site located at PFR. Here we meet Ben Van Hooijdonk and Stuart Tustin the plant physiologists who had developed the FOPS planting system. The trial is a 2D planar system aimed at controlling vigour and using light more efficiently and driven by the high cost of land in Hawkes Bay (\$100 000/ha). The narrow row spacing's were at 2m for the Piqa®Boo® pears, Jazz™ apples and 1.5m for Gala apples. All planted with twin stems at 1.35m apart and the vertical fruiting branches trained to be at 30cm apart, so 10-12 uprights per stem. This trial was in its 4th leaf and was expected to yield very well this season; Gala 85 T/ha, Jazz™ 160T/ha and Piqa®Boo® pears 35 T/ha. A very impressive trial to see and then what was more impressive were the NZ growers who were already implementing and adapting the FOPS principles into their commercial orchard plantings. The trials on growers properties had received no funding assistance from outside the orchard business it was just growers having go in their own orchard.



The FOPS Piqa®Boo® trial with Stuart and Ben from PFR



Piqa® Boo® Pears planted at 2 m row spacing using twin stems at 1.35m in the Future Orchards Planting at PFR





Lewis from Ta Mata Orchard talking about Candy Fuji apple yields.

In the afternoon we visited 3 orchards with Nic Finger. The first orchard Ti Mata was part of the Freshmax Group. Orchard manager Lewis showed us the Fuji Candy trees and Pink Lady. It was a 45 ha orchard growing Fuji Candy, Galaxy, Pink Lady and Honey Belle pears. All apples were grown as tall spindle trees on M9 rootstocks. All producing over 100 T/ha and at pack outs of over 90%. Thinning strategies were too thin to singles and all fruit was exported to Europe, Asia and US.

Next orchard was Hawkeye also part of the Freshmax group, part owner Paul talked about their integrated pest management strategies. They used specific chemistry to target pest insects

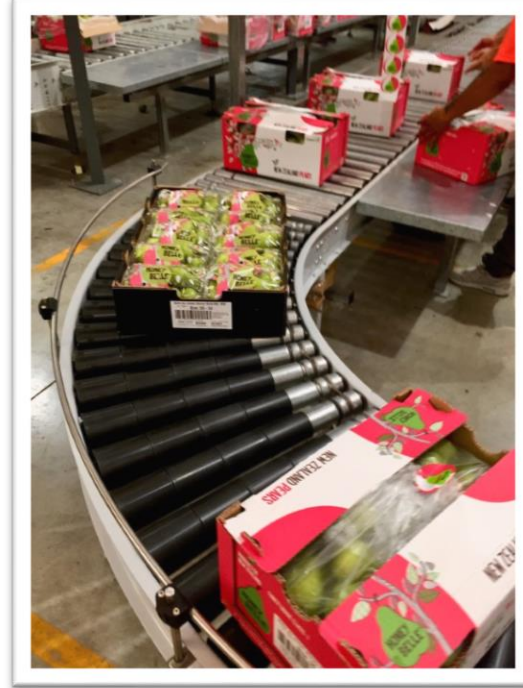
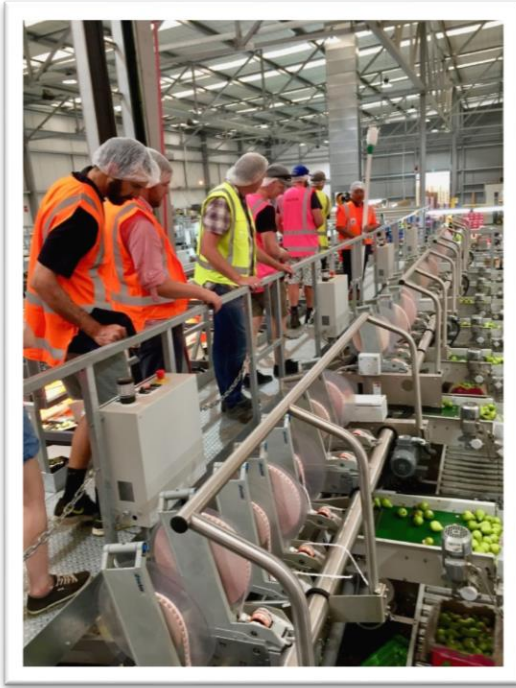
along with university students to scout for insects and monitor insect pressure and traps. They need to be able to fit all chemical thresholds as they export all over the world to many different countries with different limits. Varieties grown were Rosy Glow, Fuji Supreme, Kanzi and Pacific Queen on M9 rootstocks and Williams Bob Cherie Pears for the canning facility in Hastings.

Then onto RJ Flowers Orchard which had been in John Evans family since 1906. It was an orchard of 27ha of Jazz apples and 3ha of Envy apples and 30 ha of Kiwi fruit. They had made the change in rootstocks from M9 to CG202 because of the woolly aphid resistance. The Envy planting was at 3.7m row spacing and 1.5m tree spacing averaging 180 fruit per tree (90 T/ha) and expecting to get a 85% pack out.



John Evans talking about his Jazz apples at RJ Flowers Orchard

We then visited a Freshmax pack house that was packing the Honey Belle pears that were picked at Ti Mata Orchard. These pears were being exported to Canada and would take approximately 5 weeks to reach their destination. It was the first night shift for the season with 60 staff on the floor from 4pm until 2am. They pack approximately 150 000 bins per year of apples, pears and stone fruit.



Freshmax Packhouse Hastings packing Honey Belle pears for Canada

Tuesday Hastings

On Tuesday we spent a full day visiting orchards with Ross Wilson. The morning started with a visit to T&G (originally Turners and Growers) a BayWa Company that owns the brands of Jazz and Envy which are sold under the ENZA brand. It is one of the largest apple producing companies in New Zealand employing 300 staff, 4 packhouses and managing varieties in 13 countries around the world.



T&G Orchard FOPS planting of Envy apples

Here we met Morgan Rogers the Innovation Manager responsible for the trials on the Hawkes Bay Orchard. He had repeated the FOPS trial we had seen at PFR the day before. They had established a 5ha narrow cordon spacing trial of Envy. Planted at 2m apart 1600 trees/ha expecting to produce 150 T/ha of uniform large fruit, with the aim of increasing the volume of vertical wood.

The next trial was using V trellis with a planting of 65ha of Envy. This set up has cost 50-100% more to establish but had the production goal of 130 T/ha and were expected to produce 1000 cartons in the second leaf. No chemical thinning to be used just the ASE (artificial spur extinction). The trial was replicated in Envy, Jazz and Gala.



V Trellis at T&G Orchard



Electronic pest trap at T&G

A rootstock trial was in place comparing CG11, CG202, CG41, PM2 against M9. The CG series had shown signs of weak bud unions. They also had an electronic weather station in place, they were monitoring fruit growth using time lapse photography and electronic bug traps. Their view was to *'Get smart with what we do'*.

The next orchard we visited was Mr Apple's Blyth Orchard. There were 12 varieties grown on this 110 ha orchard including; Smitten, Jazz, Fuji, Pink Lady and Lady in Red. The orchard employed 20 fulltime staff and used the RSE (returned seasonal employment) scheme for seasonal labour.

They had a data management system called 'Billie' created for their business to record all orchard management data. They were able to



Mr Apple's twin stem planting of Lady in Red



Mark Ericksen's Gold Kiwi fruit

quote us all the statistics about their production from numbers of buds to flowers to fruit and yields for each block. They had established a new twin stem planting of Lady in Red.

Next orchard was Mt Erin which had been in Mark Ericksen family since 1913. They were part of the Waima fruit company, a group of 5 orchards that market their fruit together. They

had 79ha of Gold Kiwi fruit and 86ha of apples (Breaburn, Galaxy, Fuji, Jazz, Pacific Queen, Pacific Rose and Pacific Beauty) which were all exported.

Last orchard visit in Hawkes Bay was to Ross Wilson's new 20ha Sun Peach orchard. In late September 2017 he had planted a twin stem 3 ha Envy block at 3m by 1.5m spacing's with twin stems at 75cm apart. The block had cost \$120 000 per hectare to establish. Ross had done the modelling on the future production and he expected to produce; 30 T/ha in 2nd leaf, 50 T/ha in 3rd leaf, 70 T/ha in 4th leaf and 100 T/ha by the 5th leaf of Envy apples.



Twin stem planting of Envy at Sun Peach Orchard

Nelson

Nelson is the second largest apple growing area in New Zealand. Our host while in the Nelson region was Steve Spark Horticultural Consultant from AgFirst. Over the course of the next two days we focused on all areas of tree fruit production. We had plenty of in-field discussions focused on nursery plant material, orchard establishment, 2D and 3D tree architectures.

Wednesday - Richmond

We visited Waimea Nurseries Nelson, this is the largest commercial tree nursery in New Zealand. They are the owners of Aztec Fuji® and Lady in Red and members of the International New Varieties Network allowing them to be at forefront of growing new varieties and rootstock development. Their most popular rootstocks they supplied to commercial growers were M9 and CG202 with the varieties requested the most often; Ambrosia, Envy™, Jazz™, Gala (high coloured strains), Lady in Red, Rockit™ and Dazzle™. A recent popular request was the twin stem trees. We saw many new plantings and most of these plantings were twin stems using bench grafts.



Twin stems apple trees at Waimea Nursery



Mancozeb damage on Gala apples

were expected to be compensated.

Next orchard was Hoddy's Orchard who was focused on becoming robot ready. No ladders were used in the orchard only hydra ladders for pruning, thinning and picking. It was a 2D growing system 2.5m row spacing and 1.25m between trees. There was 400mm between the wires and grown to a height of 3.5m. Their Gala block was expected to produce 136 fruit per tree yielding 81 T/ha.

After lunch Craig Hornblow from AgFirst took us through Richard Hoddy's Vailima Orchard. This orchard was 220 ha and produced 31 000 bins per year expanding to

42 000 bins in 5 years. It was mainly a tall spindle planting style. They had converted 30 ha over to V trellis using steel frames, double graft on both sides of the V.

Then onto some orchard visits in the Richmond area looking at V trees conversions, platforms, V trellis and a Piqa® Boo® pears orchard block.

First orchard was Rob Holtham of Willisbrock, he had grafted four Envy leaders onto Breaburn trunks on a vigorus 106 rootstock. No tape or sterilization used just reciprocating saw for the bench cuts and some talc with paint mixed into a paste used to back fill the grafts. This block was expected to yield 100 T/ha. This grower had experienced damaged caused by Mancozeb (Adama), it was a russett on gala apples caused by the fungicide when spraying onto buds and small leaves with a contaminated batch of Mancozeb. Growers affected by the batch were mainly in South Island of NZ and



Hoddy's Orchard 2 D planting ready for robotic pickers

Last orchard for the day was Malcolm Salmond a pear grower Mahana Orchard, Moutere Hills. This was a 17 ha family orchard of pears and apples. Here we saw the Piqa Boo pear grown under nets, it was one of the original Piqa Boo trial sites which had been expanded.



Piqa Boo pears grown under nets

The day finished with a debrief with Steve at Mapua Wharf discussing ideas for potential trials and improvements to be made on their orchards at home.

Thursday - Motueka

Thursday the learning in the orchard was continued with more orchard visits with an emphasis on early and sustained high yields of quality fruit, intensive orchard blocks, twin stems and finishing at the world famous Kaiteriteri Beach for a final debrief with Steve.



Old Royal gala planting that had been grafted over to Envy

The first orchard was The Pines on Peach Island here orchard manager Rob showed us a 25 year old planting of Royal Gala that had been grafted over to Envy to gain another 10-15 years from the M9 rootstock.

He had used the FOPS principles in the grafts and was training 8 stems to go up for each tree with the goal of getting 80-100 pieces of fruit per limb. Using the

FOPS system they are hoping to get an increase in yield from 51 T/ha to 85 T/ha. At this orchard we also saw a Jazz row on CG 202 rootstock that had been blown over after last year's storm events before harvest as the crop load was too heavy for the trellis system.

The next orchard was Birdhurst Orchard part of the Golden Bay Fruit Company. This was another high yielding orchard with average yields of 110 T/ha and packouts of 95% for Royal Gala and 85% for Envy. Manager Aaron explained the process for dealing with European Canker in the orchard. They had 8 people looking for canker in the orchard and cutting out any diseased branches or trees. All cuts to the trees were painted and the orchard was sprayed for black spot every week until December.

A new planting of Gala on CG202 rootstock was seen on KC McLean's Orchard. This planting had really good growth for trees planted in November 2017. They had used Bagga and TDZ a growth promoting chemical to force the trees to branch out.



New Gala planting on CG202 rootstock

After lunch we visited Fairfield Orchard and Dean Rainham from AgFirst showed us a problem block of Jazz on M9 that had been that had been producing 56 T/ha of small fruit and was returned to a 80 T/ha. This was achieved by monitoring nutrition in leaves, soil and water. The soils were tested for nitrogen, potassium and phosphorous and found to be deficient in potash. After rebalancing the nutrition and improving the water pressure the yield returned to the expected 80 T/ha.

The last orchard on the tour was a T&G Orchard in Riwaka, this orchard had suffered badly from European Canker and some rows had large spaces with no trees due to tree removal of diseased trees. They were using overhead irrigation that was enabling the disease to spread. They had done some grafting of Fuji supreme on M9 across to a twin stem Envy that was producing 127 T/ha. A row of Gala that had blown over also had been grafted with some of the new grafting wood showing poor colouring fruit.



Poorly coloured Gala stems next to high coloured strain of Gala, a result of poorly sorted wood for grafting.

Grower Learnings

As part of the study tour growers were asked to send through a photo with a caption that highlighted their learnings from the day. These are some of the quotes from the group:

Quotes from Hawkes Bay



‘Multi leader 2D system was pretty impressive and a relatively easy concept to manage.’

‘My Biggest takeaway from today is seeing what we have heard so much about from the Future Orchard Walks in WA actually in practice. We hear all about pruning techniques, thinning practices and crop loading and have all these facts and figured thrown at us in a slide show. While very informative it’s amazing to see it in person and how it’s done with a more hands on approach.’

The photo is from the Research Centre of their trial trees, a very impressive facility. Seeing how well a tree can behave when it is micro managed to its maximum potential gives away so many new ideas on what would work in our orchards back home. While full scale systems of exactly what they have here may not translate to a large scale orchard in our environment the base concepts of tree growth and orchard design has given us a ton of ideas to look at. ‘





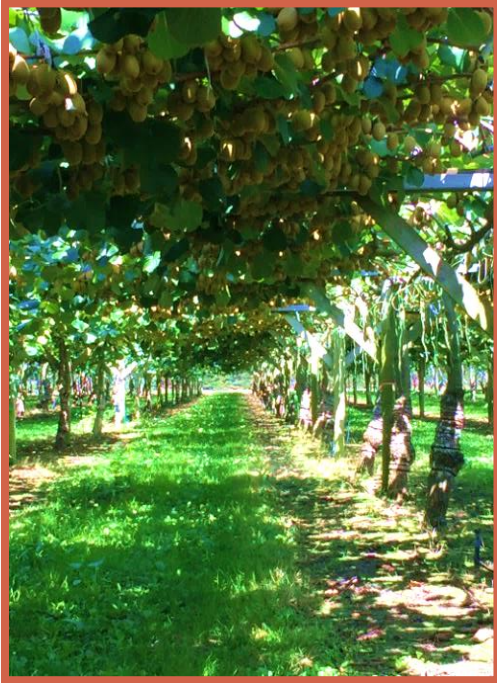
'Fantastic young block of Envy on a fabricated metal V Trellis, with possibilities of up to 110 to 140 tonnes to the hectare, T & G Trial Block.'

'Well, if there are three words I think we can take away today, its scale, precision and passion.'

The first places we went too; Mr Apple and T&G were staggering. The scale at which these guys are producing fruit was a huge eye opener to me. While they have a huge advantage over us due to the recurring worker scheme, it was still impressive to see how they make the most of the resources they have. Mr Apple data base program named "Billy" was awesome. Its shame it was in house made and not commercially available. But with all that tech and innovation they are super high volume and excellent quality producers, all due to Precision.

The way these guys are managing orchards this big with all the data they accumulate is amazing. Nothing in any block is left uncounted. Targets are set and (most of the time) they are hit and all that precision data is collected collated and translated into useful information so that anyone of the staff can pick it up and make informed decisions to maximize their potential. The amount of effort this takes from a workforce would be huge and no one would put that much effort into a job like they unless they have the passion for it.





Which brings me to Mark, it was excellent to visit his farm and firstly see Kiwi Fruit, grown excellently. Mark spared all his time to explain the growing system to a bunch of us who probably had never seen a kiwi fruit on a tree before. The enthusiasm and energy he spoke with had me hanging on every word. And it shows. His orchard was a great combination of production, quality and smart common sense farming. I was very thankful to get to see his place.

A special thanks to Ross for today too. Taking us to his home orchard we really saw his passion and excitement come out. And who would be with the impressive growth he was getting out of those new trees.'



'I really loved the adaptation of technology with the iPads at Mr Apple.

Having all the relevant information for any given block at any year would be a super important tool for expectation on crop loads and successful management of orchards.'

Quotes from Nelson Orchards



An old breaburn 106 orchard converted to envy, one of the more successful varieties grown in NZ. The new V trellis system that has been grafted is expected to yield at least 100 tones/Ha at full production, even with the old 5x2m spacings.

This is a good substitution for replanting a block and still achieving a good production with less the cost.'

'Today sure was an intense and very interesting day. We had a nice progression starting at a nursery. Starting the day at the start of the tree life is a nice way of starting out.

Seeing the practices in play at the nursery gives really good insight into the start of life for the trees we grow.

That led us to see the farmers who were really impressive with their grafting and growing techniques. I personally got a lot of their philosophies for coaxing growth out of a tree. Also learnt a lot about some chemicals that can really target growth in the tree right where you want it.



The next place we saw showed off a complete 2D system. Almost identical to ones we have just started at home. Normally on this trip we have seen tons of new ideas but comparing that to seeing not a "new idea" but a completed one you have already started was like being shown a road map of what we have done. You are here and when you get down the road, this is what it can become.

The grafting was another impressive viewing. I really liked seeing the philosophy of the rootstock being the long term part of the tree and the variety on top only lasts as long as it's



viable. If you plant the right stock and build the right system it can stay in the ground for 30+ years and have many different varieties over the top of it over that period.'

'Last off we saw Malcom. It was a great contrast to what we have previously seen. While the other farms were big and innovating at a rapid pace where Malcom was playing with a small amount of land and really bringing his innovations in at a slow pace that suits him. His Piqa-Boo pears were quite something. It goes to show that you can learn about all the innovation you want but it really has to be tailored to suit how you want to operate. Was an excellent way to cap the day off.'

'I was really impressed by this interlocking V-trellis system and the potential for yields and simplicity of management.'



'Quite' the day, today. What we saw was a lot of practical farming.

The first stop was a farmer who was adapting the new style of trellis work to his old trees. The methods really were all about the less drastic. Rather than removing and replanting a whole block or chopping it down and making the grafting take it was more focused on getting the most



value out of a block that is going to be hanging around anyway. I don't think it would suit us as it stands but that philosophy really stuck in my head.

Then we got to see the slightly darker side of NZ which was a great comparison to what we had been seeing. Pest and disease we don't deal with and some pretty hectic weather conditions. And seeing the positivity of which they face adversity and the community within their industry is something we really can learn from.'

'I will be washing my clothes with the strongest stuff I can find.'

Evaluation of the Study Tour

On the last day of the tour before returning home each participant was given an evaluation sheet to answer. These are their responses;

Q1 The overall value of the study tour?

Not Good	OK	9/9 Really Good
-----------------	-----------	------------------------

Q2 What rating would you give to the organisation aspects of the event including communications, the location, the facilities and your opportunity to participate and interact during the tour?

Not Good	1/9 OK	8/9 Really Good
-----------------	---------------	------------------------

Comments...

- The 2 days in the South Island were probably too quick, I think we didn't spent enough time there to be able to really intake the information. Have also pre-notes with the basic information of the sites could be useful to pay more attention on site.

Q3 Did you learn anything that will change your practices in your orchard?

No	9/9 Yes
-----------	----------------

This was...

- Tree training and grafting techniques
- Many aspects learnt threw out the tour
- Quality control, commination, targeting
- Grafting techniques
- Higher focus on tree volume especially in canopy
- New growing styles, varieties grafting under preforming varieties, FOPS systems, closer plantings
- Trying different training methods to see what works
- Grafting techniques, tree training orchard management

Q4 Did you learn anything that you will pass onto other growers?

No	9/9 Yes
-----------	----------------

What will you talk about...

- Tree training and grafting techniques
- New varieties, altering existing systems, watering basics and people management
- Don't be afraid of be innovative, keep research and learn, be open to collaborate with other farmers
- Try new trials, grafting techniques/systems
- Know your numbers bud/fruit counting
- Growing practices and working together as an industry to be the best

- New growing styles, varieties grafting under performing varieties, FOPS systems closer plantings
- The quality of the flint needs to be improved for the good of the grower
- Attitude team work, growing styles

Q5 Is there value, in running another study tour in the future?

No

9/9 Yes

Where to next? Tyrol Italy, 3 USA, 2 Europe, Victoria Australia

Q6 What were the 3 main lessons learned from your travels?

1

- Tree training
- Attention to detail for quality
- Innovation
- Having the confidence to try new things, taking more risks
- Know your numbers
- You need good data
- New growing systems
- Leave more growth on trees in the first few years to achieve the final ...
- Grafting techniques

2

- Control Vigour
- Don't ignore the basic fundamentals of growing
- Precision crop management
- Management techniques
- Fill the gaps in canopy
- You can make good situation out of a bad
- Potential ways to increase yield
- The large crop loads that can be achieved
- Attitudes to growing

3

- Grafting techniques
- Target variety of fruit produced
- Manage Labour
- Keep communications with growers
- Be flexible
- Varieties are the key to success
- Keeping a positive attitude and adapting to change
- Collect and record more data
- Crop loading

Q7 What were some of the opportunities you identified for change on your orchard and in WA as a result of your travels?

Your Orchard...

- Tree training to increase yield
- Higher productivity and quality from old existing systems being revamped
- Attitude towards changes and innovation better choice in labour
- Trial blocks
- Invest more time and money in ensuring trees are reaching their potential
- More tonnes per hectare
- Higher yields per hectare with closer plantings and new systems
- We need to improve our attitudes towards only putting quality fruit into the market and work towards exporting
- Grafting technique's

WA Industry...

- Same as above
- Varieties and innovation
- Collaboration, focus on general quality fruits (colour, sugar level, dry matter) to offer the best experience to customers. To exchange information with supermarkets to educate for quality
- Keep trying new systems/varieties
- High focus on a good consumer eating experience followed by accountability
- Working together
- Same as above
- Work together instead of competing
- Teamwork communications and attitudes

Q8 Is there something you would like to trial as a result of what you've seen and heard this week?

No

9/9 Yes

Trial would include...

- New tree training techniques – double leader FOPS
- Get Bravo into high quality and production and packouts, grafting IP varieties onto big rootstocks with multileader styles
- FOPS 2 D system
- Grafting new varieties, trial blocks
- Just ensure my current trials are well managed and given chance to perform
- Girdling of vigorous trees
- FOPS into older trees
- New growing styles such as FOPS twin leader trees
- Twin leader, 2D V
- Cordon system block orchards

Q9 What is your highlight from the trip?

- The scale of yield the growers are achieving with tree training technique's
- NZ look on systematic production
- Passion of the growers, looking forwards and precision
- Seeing new growing systems, meeting growers
- Growers positivity and enthusiasm in the industry
- NZ, tonnes per hectare, growing conditions and Susie's reversing skills
- See how orchards are grown outside of WA. Potential ways of changing to new systems and producing higher yields and seeing it in person and that it can be possible
- See how enthusiastic growers in New Zealand are
- Seeing massive crop loads

Q10 Do you have any other comments, questions, or concerns?

- Yes, but will follow up on latter date
- Good work Susie, thanks for everything
- More information to read and review and books
- Thanks for the opportunity Susie!
- Well organized trip, really happy



Appendix

Tour Itinerary and Contact Details

Hawkes Bay Consultants

Ross Wilson	AgFirst Hawkes Bay
Nic Finger	AgFirst Hawkes Bay

Nelson Consultants

Steve Spark	AgFirst Nelson
Craig Hornblow	AgFirst Nelson
Dean Rainham	AgFirst Nelson

WA Grower Participants

Mark Martella	Santa Rita Orchard Kirup
Basil Martella	Santa Rita Orchard Kirup
Trevor Hebbermann	Casuarina Valley Orchard Manjimup
Jade Cox	Casuarina Valley Orchard Manjimup
Joe Fontanini	T & C Fontanini Manjimup
Lucy Fontanini	T & C Fontanini Manjimup
Matt Fox	RK & J Fox Pemberton
Leila Galega	Ladycroft Orchard Manjimup
Dean Collins	Collins Bros Pemberton

Saturday 20th depart Perth International Airport (terminal 1) for Auckland

Air New Zealand flight NZ176 departing 6.55pm arriving Auckland International Terminal at 6am Sunday 21st January. Collect bags and go through customs and transfer to Auckland domestic terminal onto Mt Cook/Air New Zealand flight NZ5003 at 8.20am arriving into Napier at 9.20am.

Sunday 21st arrive Napier Airport 9.30am





We will collect our mini-van at Napier airport and drive onto Havelock North where we can check into our accommodation after 1pm. Our Accommodation is at the Harvest Lodge (<http://www.harvestlodge.co.nz/>) for 2 nights in the village of Havelock North.



Monday 22nd January 2018






Contact	Notes	Photo
Brett Ennis Prevar https://prevar.co.nz/the-breeding-process/	Prevar apple breeding and Plant and Food Research. Prevar is the Australia/New Zealand new variety breeding and commercialization program with shareholders from APAL (45%), Pip Fruit NZ (45%) and Plant & Food Research NZ (10%). Current new varieties include; Piqa Fruit (pears), Smitten®, Rockit®, Lemonade®, Sweetie™, Dazzle™, Cherish™ and Reddy Robbin® (pears).	
Natalie Proffit Plant and Food Research	Breeding high flavour apples, red fleshed pears and apples, durable resistance breeding and interspecific pears. https://www.plantandfood.co.nz/page/our-research/breeding-genomics/key-crops/pipfruit/	
Stuart Tustin Ben van Hooijdonk Plant and Food Research https://www.fruition.net.nz/2016/05/resource-title-2/	Future Orchard Production System (FOPS) New planting system 2D planar system rows @ 2m and 1.5m spacing's. Driver is cost of land and utilization of sunlight 55 – 65%. Modelling Expects 160T/ha in 4 th leaf on Jazz @ 2m spacing. Gala 1.5m spacing expecting 85T/ha in 4 th Leaf.	
<i>Clive Bakery</i>	<i>Lunch</i>	
Lewis Houkamau Tamata Orchard Freshmax	Manager of 45ha Orchard – Tall spindle trees Fuji Candy M9 140T/ha 2017 harvest with 93% pack out. Over 3 picks, 3.6 m x 1.2m spacing Thinning strategies to singles All exported to Europe, Asia & US	
Paul Vogelaar Hawkeye Orchard Freshmax	Part Owner of Orchard Planted in 2009 M9 Rosy Glow, Fuji Supreme, Kanzi, Pacific Queen Exported all over the world using IPM strategies of keeping what they've got, specific chemistry, insect scouts, codling moth traps	
John Evans Ken RJ Flowers http://tandg.global/about/our-growers/r-j-flowers-ltd/	Family Orchard since 1906 30ha kiwi fruit, 27ha Jazz 3ha Envy apples on Have changed rootstocks from M9 to CG202 because of Woolly aphid. 1.5m x 3.7m spacing's, 2 thinning's; before Christmas then a tidy up after Christmas	
Kerry Sole Freshmax Pack house http://www.freshmax.co.nz/products/apples-pears/	Honey Belle Pears exporting to Canada A total of 150 000 bins/year packed export all over the world. Night shift 4pm – 2am 60 staff	
<i>Group Dinner Maina Havelock North</i>	<i>With Ross Wilson and Nic Finger</i>	

Tuesday 23rd January 2018



Contact	Notes	Photo
Morgan Rogers Mark T&G Trial Block http://tandg.global/our-produce/apples/	Innovation Manager Brand Owner of Jazz & Envy sold under the ENZA brand T&G trial block repeated Stuart's FOPS 1600 trees/ha @ 2m spacing's, increasing the volume of vertical wood, expecting 150T/ha uniform large fruit. 5ha narrow spacing in it's 2 nd leaf. Envy on V trellis 65ha costing 50-100% more to install. Thinning using ASE hand thinning strategies. Rootstock trial M9 standard, CG202, PM2, CG11, CG 41 Camera set up to measure fruit sizing using time lapse technology. Electronic soil moisture monitoring weather station and electronic bug trap.	
Mark Anderson Ken Mr Apple Blyth Orchard https://mrapple.com/	Total business is 1140ha 4.2 million cartons \$21 million 110ha Orchard all one location growing 12 varieties; Smitten, Jazz, Fuji, Pink Lady, 10 ha of newly planted twin stem Lady in Red, using bench grafts 20 permanent full time staff/110ha Using Billie data management system	
Mark Ericksen Tim Waima http://www.mterinapples.co.nz/our-orchards/waima-fruit-company/	Family Orchard since 1913, part of a group that market together. 79ha Kiwi fruit 86ha Apples 100% export, 7 varieties' of apples; Breaburn, Galaxy, Fuji, Jazz, Pacific Queen, Rose & Beauty Gold Kiwi fruit	
<i>Silkie Oak</i>	<i>Lunch</i>	
Ross Wilson Sun Peach	20ha Orchard New 3ha Envy block planted at 3m x 1.5m, using twin stem bench grafts	

Depart Napier (flight NZ8897) at 5.20pm via Wellington arriving in Nelson on NZ8325 at 8.05pm. Our accommodation is at the Equestrian Lodge in Moteuka (<http://www.equestrianlodge.co.nz/>), a 35 minute drive from the Nelson airport.

Wednesday 24th January 2018

Contact	Notes	Photo
Mike Simpson Bruno Waimea Nurseries https://commercial.waimeanurseries.co.nz/	Family Nursery business since 1971 Including management of their, own varieties Aztec Fuji and Lady in Red. Partner with Grahams factory in Victoria Most common rootstocks M9 CG202 T397 Most common varieties; Ambrosia, Envy, Jazz, Gala early red strains, Dazzle, Kanzi Bench graft 1 yr old tree \$13 plus royalties, budded trees \$15+, twin stems \$17+ 50ha planted over a 200ha site 60 000 trees/ha	
Rob Holtham	V tree conversions Breaburn trunks grafted Envy in its 3 rd leaf, fruiting on wires (10 wires) aiming for 100T 4 stems per trunk. Mancozeb ADAMA damage causing russeting http://www.adama.com/new-zealand/en/home/recall/information-for-apple-growers Progib used to push growth along	
Kevin Hoddy's Orchard http://www.energiefruit.com/about	Technical Manager for plant protection 2D growing system 2.5m wide rows 1.25 tree spacing 400mm between wires 3.5m high. 136 fruit/tree 81T/ha Integrated operation 60ha 1100 bins	
<i>Grape Escape</i>	<i>Lunch</i>	
Craig Hornblow AgFirst for Richard Hoddy Vailima Waimea Plains http://www.luvyaapples.co.nz/	220ha Orchard producing 31 000 bins expanding to 42 000 bins in next 5 years. Tall spindle planting 3.5m x 1.5m Steel V trellis frame with Net >100T/ha Twin stem V trellis grafted over	
	Hill Planting with cox's Orange Pipin	
Malcolm Salmond Mahana Orchard Moutere Hills https://www.pressreader.com/new-zealand/the-orchardist/20171201/283051234790355	FOPS Piqa Boo Pears 17ha Family Orchard of apples & pears	
Mapua Wharf	Debrief with Steve	
Group Dinner Jelly Fish Café Mapua	Steve Spark	

Thursday 25th January 2018

Contact	Notes	Photo
Rob The Pines Peach Island	10 ha Orchard of Envy, Jazz, Gala, Galaxy, Gold Kiwi fruit and Hops Converted 25yr old planting of Royal Gala into new 3 rd leaf planting grafts using FOPS principle of lots of stems. Envy M9 block slow growing Jazz CG202 blown over too heavy crop	
Aaron Birdhurst http://www.goldenbayfruit.co.nz/grower-group/	150ha Golden Bay Fruit Marketing Co Jazz, Royal Gala and Breaburn 3.3m x 1m tree spacing Gala 248 fruit/tree = 112 T/ha 3.3x1m Cut out canker as soon as seen 8 people looking for canker Black Spot/Scab sprays every week until Dec	
KF McLean Brethren's Orchard	CG202 big 2 nd leaf trees using TDZ & Bagga to force tree to branch out Gala CG202 1 st leaf Nov 2017 planting	
PGG Wrightsons		
<i>Toad Hall</i>	<i>Lunch</i>	
Dean Rainham AgFirst Fairfield Orchard	Jazz on M9 under red net 3.25ha block poor growth, back to basics monitoring to improve growth and Yield cause was lack of potash, testing for NPK keep it simple for soil tests as standards already set for apples	
Dean Wade Aaron T&G Riwaka	150ha Orchard European Canker Wind blown down rows re-established onto existing root stocks, grafts from poorly coloured stems	
<i>Kaiteriteri Beach Debrief</i>		

Friday 26th January Moteuka – Nelson – Auckland – Perth

Depart motel at 5.30am for Nelson airport. Return hire mini-van. Depart Nelson airport on Mt Cook/Air NZ link NZ5062 at 7.20am arriving into Auckland Domestic Terminal at 8.45am, collect bags go through customs then onto Air New Zealand flight NZ175 departing Auckland International Terminal at 10.40am and arriving Perth at 1.05pm International Airport Terminal 1 Friday 26th January 2018.

Budget

The project was funded through the 2017 APC grants, with Pomewest funding 5 young grower scholarships which were awarded to each of the 5 orchards who participated in the tour. All participants were under 40 and some fee for service paying growers. The travel package (flights, accommodation and car hire) were quoted from 3 travel agents with Broadway Travel the successful travel agent. Grower payment was the cost of the international flight and accommodation, with the APC grant funding domestic flights, car hire some meals, AgFirst consultant time, project manager travel costs and coordination.