## New Zealand Study Tour 2014

Paul James Lenswood Apples

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# Report

## Project AP 13702

# New Zealand Study Tour 2014







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## **Media Summary**

In March 2014 ten participants from Lenswood Apples, the major producer of apples in South Australia undertook a 4 day study tour to the Hawkes Bay Region of New Zealand.

The study tour had 2 key objectives

- 1. Investigate the growing, handling and marketing of the new and unique "Rockit™" apple cultivar
- 2. Investigate innovative research, production and handling techniques

Lenswood Apples has recently obtained the Australian production and marketing licence for the Rockit<sup>™</sup> apple. This small, very tasty and very attractive apple was originally bred in New Zealand and has been commercialised by the Havelock North Fruit Company. Mr Phil Alison of the Havelock North Fruit Company was the developer of the unique and award winning marketing program for this variety and is overseeing its International development.

Mr Alison and members of his staff showed the study group all aspects of the production techniques being used to produce this variety. Its fruit size and several aspects of its tree growth are considerably different to any other variety being grown in Australia at present. The study tour enabled the participants to obtain a very good understanding of these growth characteristics and to utilise the information obtained to optimise the design and development of their own orchards in Australia. Of particular interest was the techniques being used to obtain early production.

Other visits undertaken during the study tour provided the group with some very interesting and invaluable information on how to enhance their existing orchard performance and any new orchards they develop. There was a consistent theme of planning properly, implementing those plans accurately and in a timely manner and focus on early tree growth to fill the allocated space in the orchard. Early performance enhances the long term economic performance of a new orchard.

Higher achieving New Zealand growers also place considerable emphasis on their trellis design and capacity considering it as an investment not a "cost". An important consideration when the yields and economic performance of many Australian orchards is compromised by inadequate tree size and support systems.

A visit to the New Zealand Institute for Plant & Food Research Limited – Havelock North showed some very interesting research work being undertaken using Australian industry research funds. Aspects of this work would be invaluable to Australian growers if similar plantings were established in Australia.

## **Objectives and Outcomes**

The study trip undertaken by 10 members of the Lenswood Apples organisation to the Hawkes Bay region of New Zealand had two principal objectives

#### **Objective1.**

## Investigate the growing, handling and marketing of the new and unique "Rockit™" apple cultivar

Rockit<sup>™</sup> is a recently commercialised selection from the Prevar breeding program. Mr Phil Alison of the Havelock North Fruit Company has obtained the worldwide commercialisation rights for this cultivar and has developed a unique and award winning marketing strategy for this cultivar. As part of the commercialisation and marketing strategy for Rockit<sup>™</sup> - Lenswood Apples recently obtained the principal Australian production and marketing licence. The trip was to enable members of Lenswood Apples to visually observe the production of this cultivar and obtain a detailed understanding of its growing and management requirements and its harvesting, handling and packing requirements.

Because of its small fruit size and the award winning marketing strategy developed for this cultivar its production and handling characteristics are significantly different to existing commercial cultivars.

#### **Outcomes**

The group were able to visit several of the Havelock North Fruit Company plantings of Rockit<sup>™</sup>. We observed older plantings plus recently planted orchards and a number of older blocks grafted over to Rockit<sup>™</sup>. This cultivar grows differently to most cultivars and has some unique cropping characteristics. The field visits and discussions clearly showed the group just how distinctive the cultivar is and how they would have to "readjust" their growing practices to handle it effectively. Careful planning, site preparation, proper planting and young tree management will be essential.

The improved knowledge gained and critical personal grower observations will enable our growers to develop well-designed orchards and production strategies for this cultivar enabling them to obtain important early and sustained production of this promising export cultivar as quickly and efficiently as possible.

An important outcome of the trip is the improved knowledge the growers have on how to improve young tree performance and utilising new techniques to effectively develop new early producing orchard blocks. This information will be particularly useful in obtaining early Rockit<sup>™</sup> fruit production.

Mr Alison also provided a formal presentation to the group outlining the history of the variety, its marketing concept and forward directions.



2012 Research planting highlighting the precocity of Rockit<sup>™</sup>



Rockit fruit on young trees

### **Objective 2**

#### Investigate innovative research, production and handling techniques

Growers associated with "Lenswood Apples" s are renowned for their innovation and interest in new production technologies. They have been keen participants in the Future Orchards project. In line with this approach a second objective of the study tour the group (in conjunction with the AgFirst group) observed the production and handling aspects of apple production on several Hawkes Bay orchards and businesses. It also visited the innovative research programs at NZ Plant and Food Institute (Havelock North) and observed some of the more promising early season Prevar selections.

#### **Outcomes**

Because of the varied nature of the visits undertaken the outcomes from each visit will be reported on individually.

#### Ross Wilson (AgFirst) - biennial bearing management

Biennial bearing is increasingly being recognised as a serious impediment to improving average yields in Australian apple yields. This is a particularly important issue for South Australian orchards, especially Fuji blocks.

Mr Ross Wilson (AgFirst) hosted a visit by the group where we we able to see his work on reducing Biennial bearing in one of his Pacific Rose blocks. Pacific Rose is an variety prone to extreme biennial bearing problems. To demonstrate the progress he has made with this block he provided us with information from his OrchardNet records (see below).

Graph – OrchardNet block yield information



As can be seen in the graph over recent seasons he has been able to achieve higher annual and less variable yields in this specific block.

Key points emphasised by Ross included

- Must do right pruning – based on bud counts and thinning targets
- Don't overprune
- Must have resting spurs the number depends on the variety. The more prone it is to bieenial bearing the more resting spurs needed (Fuji needs 2-2.5 resting spurs).
- Get and/or keep vigour out of the trees several options available • including root pruning.
- Aggressively chemical thin to reduce seed numbers quickly Ethephon, • BA and ATS preferred options.
- Use Summer NAA program 3 sprays in December
- Ensure no nutrient deficiencies (zinc is important) •
- Avoid frosts as the impact can last for 5 years.

Ross is an important member of the Australian Focus Orchards project and has provided key presentations on handling biennial bearing as part of this project. He has a very practical approach and leads by example.

#### Specific details of his approach can be obtained from the Future Orchard Field Day notes available from the APAL website. #

#### Solving Biennial Bearing

Prepared by John Wilton, Ross Wilson and Steve Spark, AgFirst November 2013 Orchard Walk

Photo – real biennial bearing problems





Biennial bearing - Getting it wrong

Biennial bearing - Getting it right

## **Crasborn Orchards and Packhouse**

#### Packhouse (host – Terry Sole)

Crasborn's is an integrated family business growing fruit and packing and exporting for itself and other growers. An important part of its business is packing fruit for other growers both conventional and certified organic.

It packs Rockit<sup>™</sup> on behalf of Havelock North Fruit Company.

A general overview of the company packing is:

- Packs for export (both conventional and export), contract packs and packs for the NZ domestic market.
- Runs 3 separate packing lines
- Handles approximately 1.8-1.9 m TCE cartons (18+ kg).
- During the export season it is packing and shipping weekly (out of Napier).
- The packhouse has a large capital investment which is not fully utilised all year.
- US Inspectors are on site during the export season to ensure that all fruit exported meets their requirements and any potential issues (biosecurity and quality) are fixed before the fruit is shipped.

- Buildings are "bugproofed" and no open doors allowed when accepting and handling fruit.
- Can receive 2,500 3000 bins /day (peak daylight hours)
- Packing lines run for 9 hours 2 shifts per day
- A shift contains 100 workers aiming at packing 10,000 ctns/9 hrs
- Aim to pack 20,000 TCE cartons / day
- Charter vessels can take 30,000 TCE Cartons
- Organic packing
  - Specific packing line and shed
  - Up to 680,000 700,000 Ctns
  - o Organic customers have their own quality requirements
  - o Fruit left on tree longer than conventional
  - o Export starts later in season
  - o 1<sup>st</sup> pick fruit is packed and put into CA
  - 2<sup>nd</sup> pick and later packed and shipped
  - Large market for organic juice apples in USA (all varieties except Gala)

Bulk bin as delivered from Grower.

Bar code holds a lot of information on the property.

SP details indicate starch rating – NZ use A,B &C





Packed fruit ready for export shipping



Packed "conventional" export

Packed "organic" export fruit



NZ packhouses provide bins to growers – limited bins owned by individual growers



High pressure cleaning prior to grading – clean out stem and calyx end (insects etc) Export packing in full swing



Export Royal Gala fruit



Hygiene is important

Extensive export markets

## **Crasborn Orchards**

#### Hawkeye & Te Mata Blocks

There is an extensive focus on young trees filling their allocated areas quickly but minimising tree to tree variability – block uniformity is considered crucial to maximising yield of quality fruit.

Crop loads are set up on young trees according to the Trunk Cross Sectional Area (TCA). No more than 7-10 fruit / TCA (cm<sup>2</sup>) depending on tree size, age and variety.

### Not quite there!



LHS Row – calm, uniform trees, good early yields 1 year younger than RHS

RHS Row – missed the target – excessively strong trees – low crop, high biennial bearing



## Getting it Right



3 year old trees (M.9) – Calm, well balanced and uniform 40 t/ha in 3<sup>rd</sup> leaf -190-200 gm fruit *Not clearly evident – strong, evenly spaced trellis system* 



Setting up young Fuji crop loads using TCA as a guide

### Strong trellis systems



1<sup>st</sup> Question in any new NZ orchard – how many tonnes do you want the trellis system to support?

Strong, high trellis systems are an integral part of any orchard

Shortcuts result in yield losses



Young Rosy Glow - 2010 planting 68t/ha 3rd Leaf

Extenday™ put in 7 weeks before harvest

## Extenday<sup>™</sup> is considered an essential tool As for its inconveniences the NZ comment was "Just deal with them" (they are helping you make money!)



Handling Extenday<sup>™</sup> the physical way

## Waimea Orchard - Carl & Kas Fairey + John Wilton AgFirst

This orchard visit was hosted by John Wilton (AgFirst) who has been a consultant to the owners Carl and Kas Fairey for many years.

The hosts were very focussed on very good early production of high value varieties, particularly Jazz, Envy and Pacific Queen. They also had examples of how they change over blocks from 1 variety to another when necessary.

They work on having a 5% change over of varieties/blocks in any 1 year with 12-15 % of the blocks out of full production at any time. There is a strong emphasis on "protected varieties" because they believe they won't become "obsolete as early as unprotected varieties".

We observed Envy blocks planted on the CG 202 rootstock which the New Zealanders consider gives them more consistent tree performance and canopy development than M.26. It is slightly stronger than M.26 but also considered weak at the graft union so good support is essential.



Jazz

Envv – a big apple





Envy x M.9 – 5<sup>th</sup> Leaf – aiming at 100t/ha Achieved 75 t/ha in 4<sup>th</sup> leaf @ 100% pack-out 1<sup>st</sup> pick

Growers are Growers everywhere!



NZ growers put considerably more significant effort into their trellis construction and capacity compared to many Australian growers

#### <u>But</u>

They still take shortcuts on supporting the end trees as well



2 leader cropping Pacific Queen trees – the end result of "step" grafting central leader Royal Gala x M.793

# The New Zealand Institute for Plant & Food Research Limited – Havelock North

Our hosts for this visit were Drs Ken Breen and Ben van Hooijdonk, apple researchers and well known to Australian apple growers through the PIP's and Future Orchards projects.

Because of the commercial nature of both the New Zealand Institute for Plant & Food Research Limited and aspects of their research work we had to sign confidentiality agreements to see all of the work that they are undertaking. Because of the requirements of this confidentiality agreement some of the information presented in this section will be general in nature.

#### **Plant Breeding**

Plant breeding and its associated evaluation programs are an important part of the work conducted at the Research Centre. In addition to the presentation of stage 1 & 2 selections by Prevar we were able to observe field plantings of stage 3 (commercial candidates) being evaluated against current varieties. No specific information can be provided.

#### **Future Orchards Planting Systems**

A highlight of the visit was a demonstration/prototype/concept trial planting of what a new high density orchard may look like in the future. The concept has arisen out of the work being conducted by the Havelock North team and the PIP's project.

In general a current orchard utilises 60-70 % of the available light, the prototype orchard is endeavouring to utilise 80+%.

The work certainly caught the interest of the growers with detailed conversations held.



Current High density orchard intercepting 60-70% of available light

M.9 Rootstock

Several views of the Prototype planting



2-Dimensional planting utilising vertical shoots approximately 30 cm apart

Simple branch structure and utilising spur extinction practices.

Current planting is using M.9 rootstock with row widths of 1, 1.5 and 2.5 m and an inter-tree spacing of 3 m.



The planting tested grower's mathematical skills.

The prototype was in advance of many of the technologies that may be needed to make it a commercial reality. It even was testing the current nursery practices because it requires a nursery tree 30% bigger than currently available.

## Rootstocks

One of the projects observed in the field was dwarfing/disease resistance rootstocks. The project was aiming for M.9- M.26 size trees with resistance to phytophthora, Woolly Apple Aphid and Fireblight. No further details can be provided.



### **Spur Extinction**

The field plantings observed are linked to the current HAL funded PIP's project where the team are working of using spur extinction practices to set up the optimum number of fruiting sites in a tree to obtain

- Minimal or no chemical thinning
- Hand thinned (easily to single fruits / bud)\*\*
- Better colour development
- Less picks (NZ usually require a minimum of 3 per variety)
- Better fruit quality
- More consistent fruit size
- Decreased pruning
- No Regalis<sup>™</sup> or other invasive vigour management techniques

#### And

• Eliminate biennial bearing.

\*\* Hand thinning needed to be done very early (1<sup>st</sup> week of November)

## An article on the work is planned for the May 2014 edition of the Australian Fruit Grower

The number of spurs required will depend on the cropping characteristic of the variety, the more prone to Biennial bearing the more spurs required to be left in the tree.

This research was providing some of the scientific rigour to the commercial practices being promoted through the Future Orchards project.

The researchers stated that the approach was aiming at

- 6 branches per metre of leaf canopy height
- Average of 5 buds / cm<sup>2</sup> of branch cross sectional area



Spur extinction demonstration planting – 3 different rootstocks - 7<sup>th</sup> leaf 2013 performance (CG 202) - 109 t/ha



Note the even distribution of fruit, evenness of fruit size, colour and shape

## **Prevar Limited**

Our visit to Prevar was also covered by a confidentiality agreement.

Our hosts for the visit were Mr Brett Ennis (Chief Executive) and Dr Richard Voltz (Plant Breeder). Whilst there we observed, tasted and evaluated the commercial attributes of a number of selections maturing at or before Royal Gala time. We also were able to taste and evaluate a number of interspecific pear selections.



Keen and attentive group



Preparing the tasting samples

## **Dissemination of Information**

Specific information gained from the study tour about Rockit will be utilised in many ways and used to train growers. Visual presentations of the trip will be undertaken and written reports made available.

Rockit is a very unique variety with some very specific tree growth and production characteristics which are different to the current varieties grown by Lenswood Apples growers. Information and photographs taken during the trip will be used to prepare grower information packages on these specific aspects of growing Rockit.

All of the information and knowledge gained on Rockit will be incorporated into orchard designs and production strategies on grower properties.

Information on the other aspects (objective 2) of the trip will be conveyed back to growers via discussions, visual presentations and reports.

### **Results of Discussions**

The information gained from the various visits and discussions held during the study tour has been presented in the "Objectives and Outcomes" section.

Because of commercial confidentiality and confidentiality agreements not all of the information can be widely distributed at this time.

## **Implications for Australian Horticulture**

Whilst the study tour was relatively short and very specifically focussed there were many aspects of what we observed that have implications for Australian Horticulture, particularly our Apple industry.

The New Zealand apple industry is predominantly export focussed with only a few businesses concentrating on their domestic market. The Australian apple industry currently has the reverse focus. This leads to difficulties in making direct comparisons but there were several observations that stood out from the trip.

These include

- Rockit has several unique growing characteristics that will make it a challenging but rewarding variety for growers.
- The marketing concept for this variety is brilliant and will open up both new domestic markets and has "ready to go" export market opportunities.
- The Future Orchards program is a unique program worldwide and has provided the Australian industry with an immense opportunity that has not yet been fully utilised. The information made available to our industry through this program is "cutting edge" and at the same level that the best growers in NZ have to engage commercial consultants to obtain.
- Tools provided by this program such as OrchardNet, fruit sizing program, Business Development program and the vast amount of information available to Australian growers on the APAL website library and webinars are significantly underutilised by the Australian Apple Industry (generally).
- The prevailing attitude experienced in the orchards visited was "what do I have to do to make what I need to happen" not "I can't do it because .........."
- Those Australian growers utilising the information and resources available to them can more than comparably perform at similar performance levels to their NZ counterparts. Our ability to handle more variable weather conditions emphasises the grower capabilities within the Australian apple industry
- Whether it is for an export or domestic market focus the better performing New Zealand growers seriously focus on orchard design and early tree life performance – they plan carefully, implement those plans in a timely and accurate manner and then use all of the resources available to them to obtain early tree growth and fill the allocated canopy area they have planned for. They do not wait for things to happen, they are proactive.
- The Australian industry should investigate the use of plant growth regulators in more detail.

- Trellis design and construction is a crucial decision and is not necessarily seen as a "cost" but an investment in an orchards physical performance, sustainability and economic performance.
- Considerable Australian industry research funds are currently being invested in New Zealand organisations. Several very interesting developments are occurring that should be duplicated in Australia so that more Australian growers can see them performing under our environmental conditions (travel time and costs). As an industry we have significant problems assessing how orchard plantings compare with each other within Australia. New Zealand (particularly Hawkes Bay) has a totally different environment to any of our growing regions. <u>Also a key aspect of adult learning processes is being able visually see the aspect you are wanting to demonstrate, teach etc. Fruit growers are well documented scientifically as having this type of learning trait.
  </u>
- Rockit is a variety originally out of the Prevar program that was discarded by many observers because of its size, not its eating characteristics. Our visit to Prevar, whilst we only saw a limited number of selections was disconcerting because of the similarity of the selections viewed to existing varieties.

## Lenswood Apples New Zealand (2014) Itinerary

Sunday 9<sup>th</sup> March

Depart Adelaide, travel to Auckland. Overnight in Auckland

Monday 10<sup>th</sup> March

Depart Auckland, travel to Napier/Hastings.

Visits

- Prevar
- Havelock North Fruit Company Rockit Apple
   o Phil Alison & Nigel Parkinson

Tuesday 11<sup>th</sup> March

Visits (Jonathon Brookes – guide)

- Ross Wilson Biennial Bearing management
- Crasborn Export Packhouse
- Crasborn Orchards Hawkeye block
- Crasborn orchards Ti Mata Block
- Waimea Orchard Carl & Kas Fairey + John Wilton AgFirst

Wednesday 12<sup>th</sup> March

Visits

(am)

- NZ Plant and Food Research Institute Havelock North
- Hastings Supermarket visit
- Jonathon Brookes Commercial variety tasting and trip debrief

(pm)

Return to Adelaide via Napier, Auckland and Sydney.

## Recommendations

- Australian apple and pear growers should be encouraged to undertake visits to New Zealand during our growing and/or harvest seasons – short, well planned trips.
- Continue (and enhance) the Future Orchards project with particular emphasis on the focus orchards and encouraging Australian growers to make better use of its resources.
- The commercial importance of good orchard planning, design, trellis construction and early tree development should be further emphasised in our industry development programs
- Research and Extension programs investigating the use plant growth regulators in Australian orchards should be undertaken and elevated as a research priority.
- Complimentary demonstration and/or replicated orchard plantings of those being established in NZ related to the PIP's project should also be set up in Australia (1 or more growing regions).

## Acknowledgments

Lenswood Apples and the participants of this study tour would like to acknowledge the financial assistance provided by HAL in undertaking this Voluntary Contribution based project.

We would also like to specifically acknowledge the following

- Mr Jonathan Brookes (AgFirst) for his invaluable assistance in coordinating study tour visits and facilitating those visits (despite considerable personal discomfort at the time)
- The NZ organisations, companies, growers, staff and AgFirst consultants who provided their valuable time and detailed, focused and valuable information

## **Contact list**

Further contact details on the businesses, organisations and growers can be obtained from the author.