Future Orchards 2.5

Jesse Reader
Apple & Pear Australia Limited (APAL)

Project Number: AP11024
This report is published by Horticulture Australia Ltd to pass on information concerning horticultural research and development undertaken for the apple and pear industry.

The research contained in this report was funded by Horticulture Australia Ltd with the financial support of the apple and pear industry.

All expressions of opinion are not to be regarded as expressing the opinion of Horticulture Australia Ltd or any authority of the Australian Government.

The Company and the Australian Government accept no responsibility for any of the opinions or the accuracy of the information contained in this report and readers should rely upon their own enquiries in making decisions concerning their own interests.

ISBN 0 7341 2870 3

Published and distributed by:
Horticulture Australia Ltd
Level 7
179 Elizabeth Street
Sydney  NSW  2000
Telephone:  (02) 8295 2300
Fax:  (02) 8295 2399

© Copyright 2012
AP11024 (Completion date: 31 March 2012)
“Future Orchards 2.5”

Author: Jesse Reader
Technical Manager
Apple and Pear Australia Limited
Ross Wilson
Horticulture Consultant
AgFirst

Research Provider: Apple and Pear Australia Ltd
39 O’Connell St
North Melbourne
Victoria

March 2012
Horticulture Australia Project Number: AP11024

Key Personnel

Project Leaders: Jesse Reader
Technical Manager
Apple and Pear Australia Limited

Project Team members: Jesse Reader
Technical Manager
Apple and Pear Australia Limited

Ross Wilson
Horticulture Consultant
AgFirst

Craig Hornblow
Horticulture Consultant
AgFirst

Annie Farrow
Industry Services Manager
Apple and Pear Australia Limited

Leanne Groves
Accounts Manager
Apple and Pear Australia Limited

Purpose
This report is the Final Report of the project known as AP11024 “Future Orchards 2.5”.

Funding
The author wishes to acknowledge the receipt of funding from the Commonwealth of Australia via Horticulture Australia Limited.

Date
31 March 2012

Disclaimer
Any recommendations contained in this publication do not necessarily represent current Horticulture Australia policy. No person should act on the basis of the content of this publication, whether as to matters of fact or opinion or other content without first obtaining specific, independent professional advice in respect of the matters set out in this publication.
Contents

1. Media Summary ............................................................................................................... 4
2. Introduction .................................................................................................................... 5
3. Project Methodology .................................................................................................... 6
   3.1 Commissioning of technical consultants ............................................................... 6
   3.2 Seasonal “Orchard Walks” .................................................................................... 7
   3.3 OrchardNet® ......................................................................................................... 8
   3.4 Business Development Program .......................................................................... 9
   3.5 Magazine, Website and Webinars ....................................................................... 10
4. Project Outputs .......................................................................................................... 11
   4.1 Orchard Walks .................................................................................................... 11
   4.2 OrchardNet® ...................................................................................................... 16
   4.3 Business Development Group .......................................................................... 17
   4.4 Magazine Articles, Orchard Walk Notes and Website Library ......................... 19
   4.5 Webinars ............................................................................................................ 20
5. Communication ........................................................................................................... 20
6. Evaluation .................................................................................................................... 21
7. Recommendations ......................................................................................................... 21
8. Additional Information ................................................................................................. 23
9. Next Steps .................................................................................................................. 23
10. Acknowledgements ..................................................................................................... 23
1. Media Summary

The purpose for Future Orchards 2.5 was to create a 6 month interim bridging project between the completion of Future Orchards 2012 (AP08032) and the new two year Future Orchards 3 program (AP11017). The main driver for this project was to continue the focus on lowering orchard production costs per kilogram of fruit and to increase the percentage of premium fruit harvested. This would not only improve the quality and consistency of fruit going to market but bring Australian orchardists up to international competitiveness in both the domestic and export markets. The theme for Future Orchards 2.5 was dubbed “growing high quality fruit at an internationally competitive price”. The project was again led by AgFirst, a world leading Consultancy Company from New Zealand, and managed by Apple and Pear Australia Ltd (APAL).

Future Orchards aims to demonstrate the skills and tools required to have an internationally competitive industry growing high quality fruit in Australia within 5-7 years.

The project comprised a number of key activities over the last 6 months: seasonal orchard walks, business development groups, access to OrchardNet®, magazine articles and webinars.

Seasonal orchard walks again provided opportunities for local growers to:
- Observe intensive orchard systems and make comparisons with traditional systems in relation to cost of production;
- Watch technical and specialist advisors demonstrate best management techniques in areas such as harvest and quality management, plant growth regulator use and pest/disease management; and
- Hear research specialists talk about the latest findings and how that can improve orchard profitability and sustainability.

Orchard walks were held twice across the eight growing regions of Australia during the 6 month project – in November and March. Block monitoring and benchmarking was made available via the OrchardNet® online database and was accessible to all growers who wished to participate. Using OrchardNet®, growers can manipulate their block data in a number of ways to generate reports that make management decisions more precise. For example, the reports can compare each of the blocks lodged by the grower or compare their blocks against others across the region (growing district) or the country.

The Future Orchards program again comprised a business development group, a new initiative in 2011. This allowed participants the ability to monitor production and benchmark fruit size, critical metrics in the production of fruit. AgFirst provided fruit sizing reports throughout the growing season.

New to the Future Orchards bridging project was the concept of web based videos. The AgFirst team provided three short videos on key topics including ‘fruit size monitoring’, ‘variation in flowering’ and ‘optimising harvest’ which were made available via the web on the APAL website. These videos provide a great insight into challenges faced during the season on various key topics and will be continued throughout the next phase of Future Orchards.

Participants of the project regularly report the significant positive changes that are being made to attitudes, behaviours and actions taken by growers. AgFirst consultants continue to be amazed at the pace of change as Australian growers take on new technologies in an effort to become more and more competitive.

As examples of the impact that the Future Orchards project provides, OrchardNet® data shows significant increases in average yield over the last 5 years:
- 58% increase for Gala (from 26 t/ha in 2006 to 41 t/ha in 2011)
- 57% increase for Pink Lady™ (30 t/ha in 2006 up to 47 t/ha in 2011)
The project has also been able to demonstrate world’s best practice actually occurring in Australia, giving local growers the confidence that it can be done.

The project was funded by Horticulture Australia Limited.

2. Introduction

The prospect of apple imports has challenged the Australian industry for many years and it is now as real as ever with New Zealand fruit currently sitting on our shelves! As an initial response to mounting concerns that Australian productivity levels were falling well behind those in many other countries, a number of study tours to Europe and New Zealand have taken place since the early years of this decade. These study tours, organised by both industry representative bodies as well as individual companies, have enabled Australian growers to view intensive planting practices and assess dwarf root stock systems. Familiarisation with world’s best practice was strengthened with the launch of the Future Orchards 2012 program with $1 million in support funding from the Commonwealth’s Industry Partnership Program. The objective of the 2 year program was to lower orchard production costs per kilogram of fruit, increase the percentage of premium fruit harvested and bring Australian orchardists up to international competitiveness in the domestic and export markets. Such has been the success of Future Orchards that it has continued to attract funding from Horticulture Australia Ltd over the past 6 years and now looks towards extending its reach for another 2 years as it moves into the next phase.

The initial Future Orchards program involved the establishment of monitoring blocks in each region so that the value of planting high densities and using new rootstocks could be observed by growers in their own regions. Farm activity on each block was measured continuously as were input costs. This and related information was presented to growers at field days held four times each year at the blocks. This gave growers first hand comparisons of the costs and returns from different tree densities and newer style tree management systems introduced with the program. Seasonal “walks” through these orchard blocks also provided opportunities for technical and specialist advisors to demonstrate best management techniques in areas such as thinning, pruning and harvesting to growers.

Intensive orchards move faster into production, produce a more consistent fruit size and make harvesting easier as well, enabling an increased harvest percentage of premium quality fruit. There are also environmental benefits to intensive orchards - chemical usage per tonne of fruit can be reduced by up to half; as as the same amount of fruit can be grown on less area, the usage of other inputs such as water and fuel is lower as well.

Learning opportunities provided under earlier Future Orchards programs led to a good uptake of orchard intensification. This past phase of the program moved beyond intensification to emphasise marketable yield and quality. Achieving a high tonnage per hectare is one thing, but it is high pack out that pays the bills and creates the opportunity for further intensification and development. Growing high quality, consistent ‘glamour fruit’ is the next challenge to add to the list for the Australian apple industry. As volumes increase along with our ability to store fruit for longer, the challenge of increasing consumption and quality is upon us.

The Future Orchards program was designed to afford growers opportunities to understand the costs and benefits of making these decisions and meeting these challenges. The program has proved particularly effective with growers experiencing:

- in-field demonstrations of current world’s best practice;
- opportunities to interact with and extract know-how from the project researchers and invited guests; and
- opportunity to discuss common issues and goals with fellow growers, industry leaders and peers alike.
The technical experts who have assisted in delivering the Future Orchards program (AgFirst from New Zealand) continue to advise APAL that some of Australia’s more progressive (and often larger) orchards have Pink Lady™, Fuji, Jazz™ and Granny Smith blocks that produce tonnages per hectare at rates as good as those achieved in New Zealand, USA and Europe.

The Future Orchards program has been highly successful in achieving technology transfer to improve the competitiveness of Australian orchardists. It is considered within the horticulture sector as a flagship for the dissemination and uptake of R&D outcomes and know-how by growers. The next phase aims to further develop this model and includes:

- greater involvement of Australian specialists dealing with regional Australian issues;
- continued development of the financial analysis and benchmarking aspects of the program;
- the program being based on all the blocks of an orchard rather than just the best ones; and
- better administration / reporting to overcome some of the problems experienced in the previous versions of Future Orchards.

3. Project Methodology

The current Future Orchards project was designed around the Industry Strategic Plan and more recently the Industry Research, Development and Extension Investment Plan endorsed by the Apple and Pear Industry Advisory Committee.

The current Future Orchards project comprised a number of concurrent and complimentary activities as outlined below.

3.1 Commissioning of technical consultants

Future Orchards 2.5 was designed as a 6 month interim bridging project between the completion of Future Orchards 2012 (AP08032) and a new two year Future Orchards 3 program (AP11017). Future Orchards 3 will represent a “step-up” in the magnitude of investment involved and additional on-ground resourcing within the growing districts to deliver the targeted outcomes. Planning the new Future Orchards 3 program was therefore expected to take some time, including a fully competitive tendering system to assess alternative providers.

An interim project was therefore required to ensure that growers continued to have access to learning opportunities about world’s best practice orchard management techniques and know-how. The providers of the earlier Future Orchards program, AgFirst were appointed to continue to provide the technology transfer service as an interim measure.

AgFirst is an independent consultancy company specialising in primary industry consultancy. It is a New Zealand based company that provides agronomy services to farmers and growers, agribusinesses and industry organisations in New Zealand, Australia and elsewhere. A number of the principal consultants from AgFirst are also commercial pome fruit growers in their own right with an intimate understanding of the issues that globally competitive growers face.

AgFirst are well known to APAL and to Australian growers through their involvement as the technical service provider to the DAFF funded Future Orchards project (2006-2008) and the extension from (2008-2011).

AgFirst have become a key strategic partner to APAL and the Future Orchards program. They have sufficient scale and experience to provide the industry with consultants and support staff with a range of high level skills and expertise in the production of pomefruit. AgFirst have been the Technical Advisory team to the Future orchards project since its inception in 2006. Over that time they have built strong relationships with growers and the Australian
grower support network giving them the ability to integrate with the entire industry and make their advice regionally specific.

### 3.2 Seasonal “Orchard Walks”

Seasonal orchard walks provide opportunities for local growers to:

- observe intensive orchard systems and make comparisons with traditional systems;
- watch technical and specialist advisors demonstrate world's best practice in areas such as thinning, pruning, harvesting and structured decision making;
- hear research specialists talk about the latest findings and how that can improve orchard profitability and sustainability; and
- have the opportunity to discuss common issues and goals with fellow growers, industry leaders and peers alike.

The timing of the orchard walks are generally scheduled during key phases of the growing season to ensure maximum relevance for discussion and provide opportunity for implementation for growers. These generally were in June/July, September, November and February. However in the last 2 years of the project (extension phase) only two walks were conducted, November and June. The most recent extension (being 6 months) forced the walks into November and March. This, however, proved to be quite successful with the March walk capitalising on harvest.

Orchard walks were conducted in the eight key growing regions of Australia:

- Tasmania
- Southern Victoria
- Goulburn Valley, Victoria
- Adelaide Hills, South Australia
- South West, Western Australia
- Batlow, New South Wales
- Orange, New South Wales
- Stanthorpe, Queensland

Local facilitators were engaged by APAL to organise the orchard field walk events. This included organising venues, presentation equipment, catering and copying and distributing papers. Facilitators were also deemed the first point of contact for the monitoring block growers and were responsible for collecting and recording information during the pre and post orchard walk discussions.

Facilitators were also required to encourage attendance amongst growers and the supply chain. Orchard Walks were advertised in advance in Australian Fruit Grower Magazine as well as in newsletters published by state organisations.

Industry Development Officers employed by state organisations or state departments of agriculture generally acted as local facilitators.

With the input of local knowledge from the facilitators, AgFirst and APAL jointly selected an appropriate farm to host the Orchard Walk with regular rotation across different orchardists and different types of orchards. Selection of the orchard venue was a critical component of an orchard walk’s success as each venue must contain enough points of interest to maintain a good 2 hour session in the field.

Orchard Walk events, which were generally held over three hours, comprised:
• an indoor public session open to all growers (and supply chain participants) in which a power point presentation was made by AgFirst consultants and a guest researcher;
• an in-field two to three hour session comprising an orchard walk and a demonstration of best practice orchard management techniques or research findings; and
• a closed Business Development Program session (see below).

3.3 OrchardNet®

Critical to the ongoing success of Future Orchards, the AgFirst OrchardNet® program – an online database tool – which has become fundamental to the Future Orchards project, was rolled out again during the recent project. It was on offer to all grower levy payers and available at no cost to the participant.

OrchardNet® is a dynamic database, enabling growers to continuously update their data. Growers are able to record details about their orchard blocks in regard to:

• Area;
• Tree spacing;
• Variety;
• Production;
• Tree management;
• Costs;
• Yields; and
• Pack-outs.

OrchardNet® can be accessed via the internet directly by the grower or their nominated consultant/reseller. An online manual provided descriptions of how to enter data and provided definitions to ensure consistency across growers.

Growers can manipulate their block data in a number of ways and generate reports to make management decisions more precise. For example, the reports can compare each of the blocks lodged by the grower or compare his blocks against others across the region (growing district) or the country. Reports generated by OrchardNet® include:

• Tree Age statistics;
• Target setting reports – crop load;
• Thinning reports;
• Pruning reports;
• Block notes;
• Plans and Objectives; and
• Financial reports.

For example, the winter pruning report (Figure 1) shows the historical performance of the block and the target number of buds per tree. This means that growers can prune a few monitor trees, count bud and modify the level of pruning before the whole block is completed.
Likewise, the thinning report can be used at hand thinning time in November/December and shows fruit numbers required per tree (Figure 2).

The system also provides for better management decision-making by allowing growers to record their plans and objectives for each block into the “Block Notes” table (Figure 3), in turn forcing growers to review the previous year and better plan for the next.

More advanced users of OrchardNet® are also able to run “Block Profit” and “Block Profit Summary” reports. A guide to using OrchardNet® “Maximizing the Use of OrchardNet - Part 1: Production Components” was provided to the Business Development Group and subsequently published in May 2011 on the Future Orchards website. In addition, Future Orchards 2.5 has provided an online video with step by step instructions for navigating through the software.

### 3.4 Business Development Program

In 2010/11 the extension project dropped the Monitor Block program and replaced it with the Business Development Program (BDP). This was a new initiative, commencing in October 2010. This program has been carried forward in 2011/12 and continued to be taken up. It provided growers with the ability to monitor and benchmark production and fruit size using...
the OrchardNet® platform. Growers were able to compare fruit size from their orchards against regional / national averages, historical data and target lines.

Growers wanting to actively participate in the Business Development Program were required to make a minimum commitment of entering fruit size data for 2 blocks of trees, with preference given to Royal Gala and Pink Lady™ blocks. The variety preference was a reflection on the number of blocks that were being monitored in OrchardNet® to give robust national trend lines for fruit size behaviour.

Participation required data on:

- block setup details e.g. tree no, spacings, areas etc;
- last 2 years crop history (yield, pack-outs and fruit size);
- target yield for 2012;
- key metrics such as full bloom dates and fruit numbers post thinning; and
- fruit size monitoring throughout the season (a minimum of 6 readings but preferably more).

A fruit size monitoring protocol was established and provided to participating growers. If the grower's objective was to monitor fruit growth rate the protocol suggested growers monitor 20 fruit per block on a weekly basis. To reduce time spent on data collection the consultants advised growers to choose a representative row that was visited regularly for other reasons (e.g. pest traps or soil moisture). They suggested that 4 average trees in that row be tagged and 5 representative (average) pieces of fruit marked for each tree. The same 20 fruit were measured weekly to get a good idea of growth rate. However if the grower required fruit size monitoring to provide good data for crop estimate profiling, growers were advised to increase the number of fruit to 100 minimum per block. Business Development Group growers were responsible for entering all data themselves or nominating a consultant/merchant to work with them to help collect and enter data.

Whilst the Future Orchards 2.5 project didn't add as many new blocks to the system over the last 6 months as was hoped, the software is still available and being actively used by those involved. Several big growers this year added all their blocks to the system, further demonstrating the value in the tool. A continued focus on adoption of the software will be carried into the next phase of Future Orchards.

### 3.5 Magazine, Website and Webinars

Between the magazine and APAL website, the Future Orchards program was able to make all presentations delivered at the orchard walks and the notes associated with orchard best practice, available to all levy payers and industry participants. The Australian Fruit Grower Magazine published 4 articles prepared by the AgFirst team covering the following key topics:

- Setting the optimum crop load – November 2011
- Mid season orchard management – December 2011
- Getting the basics right – February 2012
- Mid-Late Season Orchard Husbandary Management – March 2012

These articles continued to provide a technical backbone to Australian Fruit Grower Magazine and are always well received.

The website has also hosted three short videos this year produced by the AgFirst team. This is the first time the Future Orchards project has gone down the webinar path and received positive feedback from sections of the grower community. Importantly it enabled those
growers or orchard workers who were unable to attend the actual field days to receive the key message and learning points at a time more suitable to their business schedule. Additionally it has enabled growers and/or employees to review material multiple times, an important element in learning new orchard management techniques. Video technology is expected to become a powerful technology transfer mechanism moving forward. It will enable growers to access international expertise more readily and on topics that follow the production cycle timing without necessitating expensive travel to each of the Australian growing regions, some of which are relatively "remote" from capital cities.

The APAL website has also become an important industry resource with all of the material generated by the Future Orchards programs since its inception in 2006 being lodged online and available to levy payers. The planned upgrade to the APAL website and the move to make it more user friendly to growers and their advisors should extend (and re-extend) the dissemination and adoption of the key messages, learning points and know-how that the Future Orchard program has and continues to provide.

4. Project Outputs

The Future Orchards 2.5 extension program was designed to afford growers the continued opportunity to understand the costs and benefits associated with establishing, implementing and managing internationally competitive orchard systems. With the focus being more specifically on determining the real cost of production associated with growing high quality fruit. This was achieved through orchard walks, data analysis, webinars, technical presentations and the publication of materials for growers across the industry.

4.1 Orchard Walks

The Orchard Walks catered for:

- in-field demonstrations of orchard best practice on a number of key topics;
- opportunities to interact with and extract know-how from the project researchers; and
- network and communicate current issues and challenges with like minded individuals.

Orchard walk topics were carefully selected by the project management team so as to be relevant, informative and delivered in a timely manner in accordance with the projects aims. Each growing season the project would have a theme that would be the basis for the topics to be discussed at orchard walks. Themes and the diversity of material delivered over the years and touched upon regularly are depicted in Figure 4.
Two walks were undertaken in each region since the commencement of the project in October 2011. The walks were taken as two groups comprising a northern loop (Stanthorpe, Orange, Batlow and Shepparton) and a southern loop (Southern Victoria, Tasmania, Lenswood and Western Australia). An AgFirst consultant led each walk and was supported on all loops by the APAL technical manager and a guest. During the March northern loop, the order was reversed to work in with harvest. The specific topics and presenters for each walk are shown in Figure 5.

<table>
<thead>
<tr>
<th>Date</th>
<th>Region</th>
<th>Content</th>
<th>Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>14/11/2011</td>
<td>Stanthorpe</td>
<td>Growing high quality fruit at an internationally competitive price</td>
<td>Steve Spark (AgFirst)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Steve Tancred (Orchard Services)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Jesse Reader (APAL)</td>
</tr>
<tr>
<td>16/11/2011</td>
<td>Orange</td>
<td>Growing high quality fruit at an internationally competitive price</td>
<td>Steve Spark (AgFirst)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Steve Tancred (Orchard Services)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Jesse Reader (APAL)</td>
</tr>
<tr>
<td>Date</td>
<td>Location</td>
<td>Topic</td>
<td>Presenters</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------</td>
<td>----------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 17/11/2011 | Batlow            | Growing high quality fruit at an internationally competitive price    | Steve Spark (AgFirst)  
Steve Tancred (Orchard Services)  
Jesse Reader (APAL)               |
| 18/11/2011 | Northern Victoria | Growing high quality fruit at an internationally competitive price    | Steve Spark (AgFirst)  
Steve Tancred (Orchard Services)  
Jesse Reader (APAL)               |
| 21/11/2011 | Kirrup            | Growing high quality fruit at an internationally competitive price    | Ross Wilson (AgFirst)  
Rob Green (Lenswood Co-Op)  
Jesse Reader (APAL)               |
| 22/11/2011 | Lenswood          | Growing high quality fruit at an internationally competitive price    | Ross Wilson (AgFirst)  
Rob Green (Lenswood Co-Op)  
Jesse Reader (APAL)               |
| 24/11/2011 | Tamar Valley      | Growing high quality fruit at an internationally competitive price    | Ross Wilson (AgFirst)  
Rob Green (Lenswood Co-Op)  
Jesse Reader (APAL)               |
| 25/11/2011 | Southern Victoria | Growing high quality fruit at an internationally competitive price    | Ross Wilson (AgFirst)  
Rob Green (Lenswood Co-Op)  
Jesse Reader (APAL)               |
| 19/3/2012  | Northern Victoria | Growing high quality fruit at an internationally competitive price    | Craig Hornblow (AgFirst)  
Prf. Kerry Walsh (CQU)  
Prf. Phul Subedi (CQU)  
Jesse Reader (APAL)               |
| 20/3/2012  | Batlow            | Growing high quality fruit at an internationally competitive price    | Craig Hornblow (AgFirst)  
Prf. Kerry Walsh (CQU)  
Prf. Phul Subedi (CQU)  
Jesse Reader (APAL)               |
| 21/3/2012  | Orange            | Growing high quality fruit at an internationally competitive price    | Craig Hornblow (AgFirst)  
Prf. Kerry Walsh (CQU)  
Prf. Phul Subedi (CQU)  
Jesse Reader (APAL)               |
| 23/3/2012  | Stanthorpe        | Growing high quality fruit at an internationally competitive price    | Craig Hornblow (AgFirst)  
Prf. Kerry Walsh (CQU)  
Prf. Phul Subedi (CQU)  
Jesse Reader (APAL)               |
| 26/3/2012  | Manjimup          | Growing high quality fruit at an internationally competitive price    | Ross Wilson (AgFirst)  
Prf. Steve McArtney (USA)  
Jesse Reader (APAL)               |
| 27/3/2012  | Lenswood          | Growing high quality fruit at an internationally competitive price    | Ross Wilson (AgFirst)  
Prf. Steve McArtney (USA)  
Jesse Reader (APAL)               |
| 29/3/2012  | Huon Valley       | Growing high quality fruit at an internationally competitive price    | Ross Wilson (AgFirst)  
Prf. Steve McArtney (USA)  
Jesse Reader (APAL)               |
| 30/3/2012  | Southern Victoria | Growing high quality fruit at an internationally competitive price    | Ross Wilson (AgFirst)  
Prf. Steve McArtney (USA)  
Jesse Reader (APAL)               |

Figure 5: Orchard Walk Topics
Outcomes from each of the series of walks were provided in debriefs from AgFirst to APAL. These were in written format and some included verbal feedback with AgFirst consultants travelling to Melbourne to meet with management. Feedback from the walks held in November 2011 and March 2012 show that the public component of the event comprised of the following:

**November Orchard Walks**

*PowerPoint Content*

- Producing high quality fruit at internationally competitive cost of production presented by Ross Wilson and Steve Spark.
- Producing high quality fruit by Stephen Tancred – pest and disease management.
- Quality and cost of production prepared by Paul James in South Australia.
- Alternaria leaf blotch and fruit spot of apple presented by Dalphy Harteveld (this was presented by Jesse Reader in most other regions, other than Stanthorpe).

*Field*

We took the message of producing high quality fruit at an internationally competitive price into the field using a range of blocks on each orchard venue to debate and discuss the management inputs required. There was also good debate about costs of production, labour efficiency that reinforced all of the notes that were made in the presentations.

**March Orchard Walks**

*PowerPoint Presentations*

- Producing high quality fruit at internationally competitive cost of production – creating value from harvest to sale. Presented by Ross Wilson and Craig Hornblow.
- Plant growth regulators in modern apple production. Presented by Prof Steven McArtney.

*Field*

In the field we continued the discussion of growing “high quality fruit at an internationally competitive price” and “creating value from harvest to sale”. We used a Near Infra Red gun and the more traditional iodine test to demonstrate variation in fruit maturity and colour, discussing the implications of this on supply chain choices and the experience for the consumer. The concept of Fruit Dry Matter was also introduced to the grower groups.

The closed component of the event is reported in the section relating to Business Development presented below.

The number of attendees at Orchard Walks varied across the growing districts as usual but a good average of around 20 participants per orchard walk was seen as a great sign moving forward.
Tasmania, March 2012

Southern Victoria, March 2012

Presentation by Steve McArtney - March 2012
4.2 OrchardNet®

OrchardNet® is a key management tool provided to growers as part of the Future Orchard’s program. AgFirst uploaded the historical data from the DAFF funded Future Orchards project (2006-2008) and the HAL funded extension project (2008-2010) onto the OrchardNet® database. The inclusion of historical data provided the capacity for trend analysis.

Under previous projects OrchardNet® had the capacity to lodge data for up to 200 orchard blocks from across the country. In the 2011/12 growing season APAL made an additional 150 blocks available to Australian apple and pear growers.

Whilst the Future Orchards 2.5 project continued to promote the use and capabilities of OrchardNet®, uptake continues only slowly and more must be done to encourage more widespread use, particularly in Western Australia, South Australia and in Orange. Those who do use OrchardNet® view it as an invaluable tool for fruit growing and essential to their business decision-making.

Participants of the project regularly report the significant positive changes that are being made to attitudes, behaviours and actions taken by growers. AgFirst consultants continue to be amazed at the pace of change as Australian growers take on new technologies in an effort to become more and more competitive.

Hard data taken from the OrchardNet program (Figure 6) shows average yield of Gala increasing from 26 t/ha in 2006 (the first year of Future Orchards) up to 41 t/ha in 2011 with a general long term increase throughout that 5 year period.

![Figure 6: Royal Gala gross production](image)

The same data for Pink Lady™ (Figure 7) shows the average increasing from 30 t/ha in 2006 up to 47 t/ha in 2011.
The project has also been able to demonstrate world’s best practice actually occurring in Australia, giving local growers the confidence that it can be done. Figure 8 below shows a young block of Rosy Glow with a yield profile of 15t/ha in the 2nd leaf, 33t/ha in the 3rd, 66t/ha in the 4th and 80t/ha in the fifth. An accumulated yield of 194 t/ha within 5 years of planting. World best practice aims for 150t/ha.

These three examples clearly show the Future Orchards projects considerable impact on some of the Key performance Indicators of an internationally competitive Australian industry.

4.3 Business Development Group

The Business Development Program was complementary to the Orchard Walks and provided further encouragement for ongoing grower involvement. It was a new initiative in the
previous project and was designed for growers who want to work “on their business” and not just “in their business”.

The Business Development Program has enabled growers to monitor and benchmark their own fruit size. Monitoring fruit diameter throughout a season is an important tool for the orchard decision maker as it provides real and timely feedback on the progress of the crop.

Analysis of the fruit size data was undertaken by AgFirst and provided in detail to a closed Business Development Group session held after the seasonal Orchard Walks. Closed sessions provided a reward to those growers who participated by monitoring their fruit size and entering their data onto OrchardNet®. However regular summary reports were made available to all growers via posting on the website.

During this project only one business development session was held (November) and more informal meetings on site with key growers post orchard walk in March.

An example of the fruit size reports generated for the Business Development Group participants are seen below. The first (Figure 9) shows fruit size growth progress for Royal Gala from days out following full bloom against previous seasonal and current regional averages. The second (Figure 10) shows weekly growth rates for 2009, 2010 (a very hot year) and 2011.
There was sufficient participation from fruit growers in Southern Victoria, NSW and Tasmania to allow good regional trend lines on fruit size to be drawn for these production areas. Data from other Australian districts was limited and often the regional trend line related only to the one or two blocks on the database. This may not give an accurate picture of the overall fruit size behaviour in those districts. AgFirst advised growers that until there is more participation among growers in these other districts, benchmarking against the national trend lines using Days After Full Bloom (DAFB) will give a better basis for judging fruit sizing progress.

Fruit Size Reports can be viewed on the APAL website under the Future Orchards section.

Following the November 2011 Orchard Walk events AgFirst provided APAL with briefing on the outcomes of the closed sessions provided to the Business Development Group. A business development session was made available at all growing regions. It was also an open session to look at things outside of the normal programme if time and grower interest permitted. This included:

- AgFirst consultants discussed the outcomes of the Business Development program using a case study of those growers that used the data to change orchard management practices, posing the question “How did it work”?
- AgFirst consultants provided training with regard to helping growers maximise the usefulness of OrchardNet® going forward. They indicated that growers should have a base goal of entering the 2 years of history 2011 & 2012, set an educated target for 2013, define their block objectives and produce an annual plan. The financial components of OrchardNet® were demonstrated for advanced users.

**4.4 Magazine Articles, Orchard Walk Notes and Website Library**

The Future Orchards project delivered its relevant findings, updates and reports via several methods of media, the main one being articles in Australian Fruit Grower magazine. The
magazine articles were very well received, with feedback that they were of a high technical content and provided linkage and timely management advice throughout the growing season.

Recent examples of Fruit Grower Magazine articles are:

- Setting the optimum crop load – November 2011
- Mid season orchard management – December 2011
- Getting the basics right - February 2012
- Mid-Late Season Orchard Husbandary Management – March 2012

4.5 Webinars

There were plans to organise a number of webinars throughout the year. They were viewed as an alternative low cost mechanism to reinforce industry development initiatives. The webinars were aimed at a cohort of growers comfortable with internet video technology. It was however decided that due to our growers being spread over several different time zones and the risk of poor internet connection being high that we would simply commission AgFirst to create 3 short videos and make them available on the web. This system has worked well however we will monitor the traffic as time goes on to determine the efficacy of this form of communication.

5. Communication

The Future Orchards 2012 project has utilised a number of communication channels for liaising with growers and the supply chain. They include:

- Australian Fruit Grower: During the life of the project over 4 articles were prepared for the Australian Fruit Grower Magazine on technical matters. These included findings of the Future Orchards program but also included a range of other technical issues prepared by AgFirst consultants. Examples include setting crop loads and pruning.
- APAL e-News: The Technical Manager provided timely articles on Future Orchards updates, upcoming events and technical bulletins.
- One on one technical extension: The Technical Manager attended regional grower association meetings and Future Orchard farm walks and responded to grower telephone calls and emails. The Technical Manager also developed extensive networks with the industry development officers associated with State departments of agriculture and state industry bodies as well as with private agronomists and agri-business consultants and chemical resellers. These channels allowed for the highest possible level of communication on all Future Orchards matters.
- Future Orchards Website: http://apal.hortwatch.com/fo2012/library.php All material presented at the Orchard Walks (technical notes to demonstrations and research presentation papers, Orchard Business Analysis and Business Development Group results on fruit sizing) were uploaded to the Future Orchards website. A list of material available on the website is provided below:

<table>
<thead>
<tr>
<th>Recent Additions - March 2012 Orchard Walks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tools for assessing internal fruit quality</strong></td>
</tr>
<tr>
<td>(notes)</td>
</tr>
<tr>
<td><strong>Tools for assessing internal fruit quality</strong></td>
</tr>
<tr>
<td>(presentation)</td>
</tr>
<tr>
<td><strong>Some Uses of Plant Growth Regulators in</strong></td>
</tr>
</tbody>
</table>
6. Evaluation

Based on the feedback received against the objectives of this bridging project, Future Orchards 2.5 can be deemed a success. Key points confirming this include:

- 99% positive feedback via the “feedback forms” returned on the day;
- strong feedback and support on the Technical Managers attendance to all walks;
- plenty of positive comment on the direction we are beginning to now take Future Orchards in i.e. digging deeper into local issues and applying relevant strategies;
- great feedback from the growers about several of our guests over the last 6 months; and
- strong support on existing format i.e. inside/outside sessions.

7. Recommendations

The recommendations below, as stated in the Future Orchards 2012 Final Report, are still very applicable and have been incorporated into the planning already for AP11017.
Recommendations as per AP08032

The Future Orchards 2012 project has helped focus the apple and pear industry on technical development. It has provided a learning platform to help Australian growers to prepare for import competition. This was done by raising the outputs from orchards so that they are internationally competitive in terms of orchard efficiency, quality and price, as well as being environmentally sustainable.

Although imports from China and New Zealand are now a reality, the reorientation of the Australian industry is only partially complete and the continuation of this industry development (extension) model should be seen as crucial to the industry. As a mechanism for delivering world’s best practice orchard management techniques and for disseminating the latest research, Future Orchards is a good model. The Future Orchards project has proven that in-field demonstration complemented by business management tools encourages greater awareness and uptake by growers.

Continued efforts to transfer technology and know-how will assist the industry to build a capacity to not only survive the competitive pressures created by imported product but also create a sustainable long term future. Capitalising on the momentum created by the Future Orchards project is important - the mindset of many growers is now more accepting of change and import volumes are still low. Slowing down on the rate of technology transfer might cause growers to miss opportunities to build a competitive and sustainable business.

Specific recommendations arising from the Review conducted by the Technical Manager in 2010 should be include in any future technology transfer program. These recommendations include:

- There is overwhelming support for the continuation of the program in all regions;
- Activities and outcomes of the PIPS program are to be incorporated into the new program;
- June and November should be the preferred months for orchard walks to take place; however regular contact through the growing season as participants face specific issues could be used to improve the uptake and reinforcement of the new ideas presented at the Orchard Walks;
- The current model of a 2-3 hour event with a mix of indoor presentations and infield demonstrations should continue to be utilised for delivering information, however demonstrations should ideally be made to groups no larger than 20 people to encourage dialogue between presenters and participants;
- The program needs to pitch different levels of technology transfer to target specific cohorts within the grower community;
- The program could assist growers less confident in adopting the technology transfer by facilitating local groups of growers to meet between the rounds of orchard walks to discuss how they are going about implementing the ideas and dealing with their change in practices. Having regular meetings, whether they be face-to-face or via phone hook-ups, has increased the individual growers connection to and confidence in the ideas in some areas. This system could be emulated;
- A revised monitor block program that monitors a wider range of blocks within an orchard needs be included;
- The regional aspect including regional champions (monitoring block growers) needs to remain to achieve buy in from industry participants;
A principal objective of the new technology transfer program will be to ensure industry participants understand how to determine block profitability on their own orchard;

The program needs to extend beyond the orchard gate and incorporate outcomes of consumer research into on farm activities;

The industry’s private advisors and commercial consultants should become involved in the new technology transfer program with APAL actively engaging them through consultation (an advisors network); and

A new program needs to be specifically developed for the pear industry.

Recommendations made by AgFirst and APAL staff additional to those above should also be considered in any future technology transfer program. These are:

- Articles for the Australian Fruit Grower Magazine are a good initiative. However they need to be branded as a Future Orchards product to ensure growers link the field walk with the article;

- Webinars should become a more regular feature of the Future Orchards program. Webinars provide a fantastic means for large groups to listen and learn from international speakers without either party leaving their respective countries. Additionally, the sessions can be taped for lodgement on the APAL Future Orchard’s website which can be viewed by growers at times that are convenient for them. Dairy Australia reports that webinars (and web forums) are working well as a learning tool for farmers;

- The roles and responsibilities of local Facilitators should be clarified;

- The program needs to be promoted more thoroughly to attract a larger number of participants; and

- A Focus Orchard network is likely to take an ongoing project forward with a new fresh technology transfer approach.

8. Additional Information

APAL’s Technical Manager, Mr Jesse Reader, has been employed by APAL since August 2011. This has allowed the project to be again managed and driven by the Technical Manager and taken pressure away from APAL’s Industry Services Manager (Ms Annie Farrow) to deliver this role.

Going forward into the next phase of Future Orchards (AP11017) APAL has engaged the additional services of Alma Reynolds to help with administrative matters related to the project. Alma was intimately involved with the original DAFF funded Future Orchards program.

9. Next Steps

The Future Orchards program has been a valuable tool in helping the Australian apple industry to shift toward a greater level of international competitiveness. APAL is now focussing their efforts into the two-year Future Orchards 3 program with AgFirst as the major provider. The new program commenced on 1 April 2012.

10. Acknowledgements

This final report wishes to acknowledge:

- Mr Jesse Reader, APAL’s Technical Manager, has effectively steered this project over the last 6 months and will continue focussing his enthusiasm into the next phase;
• AgFirst Consultants Ross Wilson, Craig Hornblow and Steve Spark;
• Mr Stuart Gray, APAL’s Communications Manager. Mr Gray worked with the Technical Manager to achieve the industry communications roles of the Future Orchards 2012 program via the Australian Fruit Grower magazine and APAL’s e-News and website; Stuart has since resigned and has been succeeded by Ms Sarah Kulman;
• Ms Annie Farrow, APAL’s Industry Services Manager; and
• Ms Leanne Groves, APAL’s Accounts Manager.