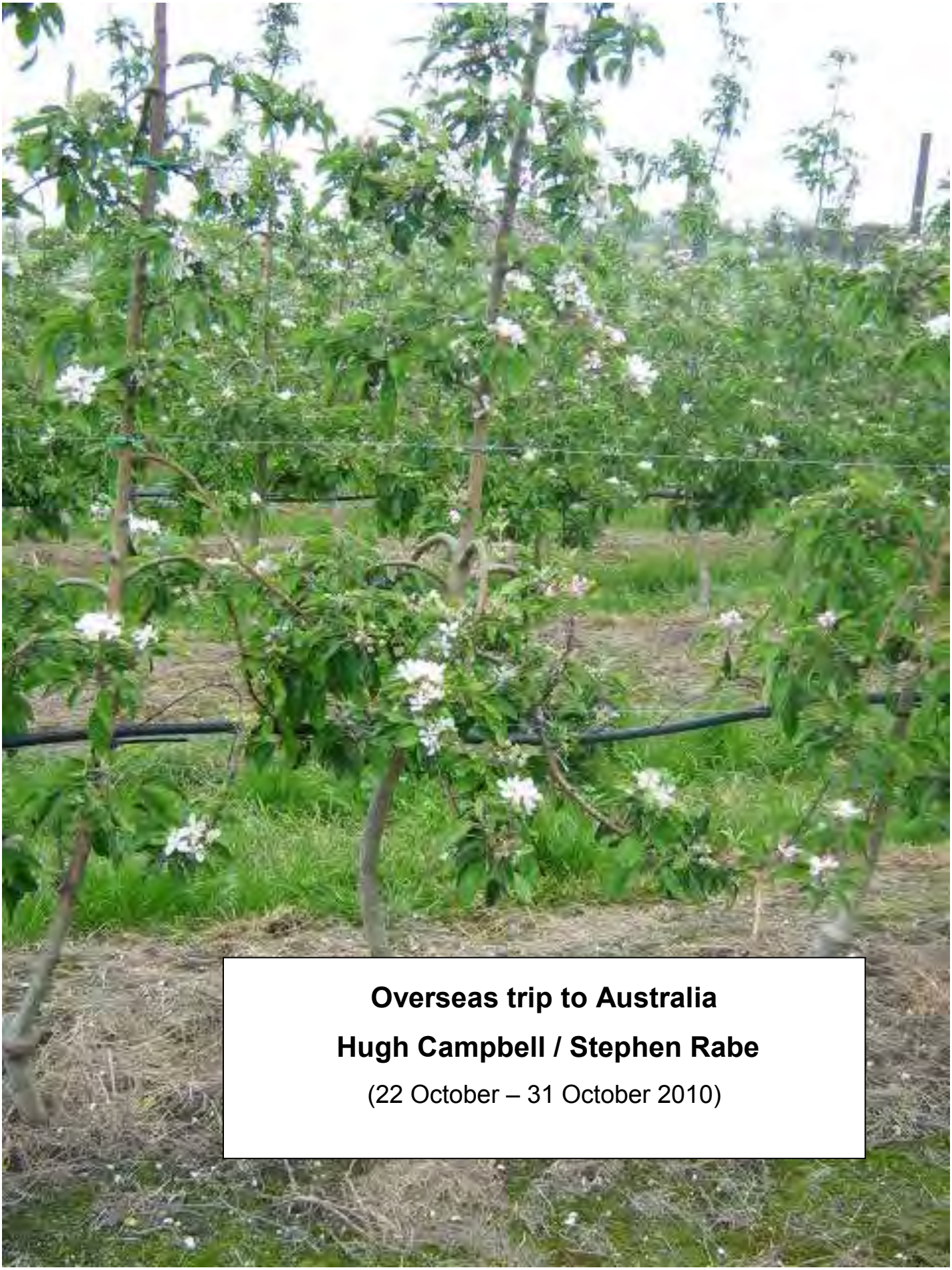


Overseas trip to Australia

Hugh Campbell / Stephen Rabe

(22 October – 31 October 2010)

Overseas trip to Australia – Hugh Campbell / Stephen Rabe

(22 October – 31 October 2010)

Contents:

Executive Summary

The objective of the visit to Australia was:

- To learn from their 4 years of experience in running the "Future Orchards 2012" programme. What works well and what did not work"
- To gain an understanding of their PIPS (productivity, irrigation, pests & soils) programme. How it structured and what are the potential collaboration opportunities.
- To explore the linkages between the newly completed APAL RD&E strategy and the new Fruitgro^{science} strategy
- To build relationships and linkages.

The APAL RD&E strategy focuses on:

- Defining 5 clear research programmes (Productivity and supply chain / Climate Change / Germplasm improvement (cultivar development and evaluation) / Market Access and Biosecurity and Market Research)
- Capacity development (Industry development)
- Programme Management (Portfolio management)
- Extension – getting the message out as effectively to their grower base.

This is almost a replica of the Fruitgro^{science} strategy excluding climate change and market research. It is recommended that a similar document be drafted for Fruitgro^{science}.

Future Orchards 2012 is an APAL managed programme designed to lift the productivity of Australian apple and pear orchards to world competitiveness. This programme has had a major impact on the Australian grower and has bought considerable credibility to the Grower Organisation. Its focus is to bring the latest and best technology to the grower in a grower friendly format – field days and applied focused seminars. It has now grown into a landing ground for new technologies flowing out of research. Its success is built on

having good facilitators, credible presenters, presentations and discussions tailored to the grower needs and relevant topics.

The PIPS programme is a well planned integrated research programme focusing on pre-harvest production factors for apples and pears. It is output driven, with direct accountability allocated to a programme manager and 3 project managers. It has a very well thought through programme management system with clear milestone management and a defined communications strategy. The structure of the programme is similar to the proposed structure of Fruitgro^{science}. There are good learning opportunities as well as an opportunity for collaboration. It is proposed that once the Fruitgro^{science} research strategy has been finalised further consultation should take place.

The take home message from this visit is that the Fruitgro^{science} strategy is on the right track. A comprehensive RD&E strategy document for each fruit type should be drafted with assistance of an expert and the SA version of Future Orchards should be rolled out as a project with defined goals and measurable outputs.

A final word of thanks to the Fruitgro^{science} Board for motivating and supporting this visit and to SAAPPA for providing the funding.

1. **Objective of the visit:**
    a. **Future orchards 2012 programme**
    - Apple and Pear Australia Limited (APAL) initiated the project 6 years ago. The objective of the visit is to learn from their experience – what worked well and what did not work.

    b. **PIPS (Productivity, Irrigation, Pests & Soils) Programme / collaboration**
    - Gain a clear understanding of the objectives and strategy of this programme.
    - Explore the linkages with our research programmes.
    - Explore collaboration opportunities.
    - Explore the linkage between the Future Orchards 2012 and the PIPS programmes.

    c. **Research Strategy**
        - APAL have just completed a RD & E (Research Development and Extension) strategy. Learn from their strategy and explore the linkage between their strategy and SA strategy.
        - Explore collaboration opportunities and opportunities to leverage further funding.

    d. **Built relationships and linkages**
        - Follow up on contacts made during 2005 visit.
        - Build relationships where there is seen to be a common benefit.
        - Develop formal and informal relationships with key individuals.

2. Background

a. Size of the industry

The major production areas of the Australian Apple and Pear industry are based in the growing regions of Stanthorpe in Southern Queensland, Orange and Batlow in NSW, Goulburn Valley and Southern Victoria, Huon Valley in Tasmania, Adelaide Hills in South Australia, and Perth Hills, Donnybrook and Manjimup in Western Australia.

In 2007 the industry produced 270,456T apples (down on the 2002 season from 320,526T). Only 2,8% of this crop was exported (7,720T). This volume in 2007 was produced from over from over 10 million trees. The industry produced 140,716T pears (down on the 2002 season from 144,885T). Exports represented 1,5% (2,178T) of the total production. This volume in 2007 was produced from over 1.6 million trees (excluding Nashi).

Figure 1. Main production areas of Pome fruit in Australia

South Africa Apple production is 808,916T (37% exports), almost 3 times that of Australia and SA's pear production is 347,636T (42% exports) is 2,5 times larger than Australia.

b. Industry drivers

It is evident that the Australian industry is currently focused on its local market. Up until now Australia has managed to keep almost all imports out of its local market. This is due to change. It is expected that the fist Chinese Fuji's will arrive in December 2010 and the first apples from both North West USA and New Zealand will arrive within the next year or two.

The key industry drivers / primary objectives are the following:

1. Stimulate domestic demand by 5% through product quality and innovation.
2. Expand apple and pear exports markets to 10 % of marketable product exported by 2015.

c. National Horticultural Research Network (NHRN)

The National Horticultural Research Network was put in place a number of years ago by Australia's State and Commonwealth agricultural agencies (largely State primary industries agencies and CSIRO) to streamline the different research organisations in the different states of Australia.

The NHRN developed a plan for future investments in Australia's horticultural industries titled: "National RD & E framework for Horticulture" which was published in September 2010.

The document looks at the following;

- Situation and outlook (analysis of the industry).
- Analysis of, RD& E resources and capabilities.
- Situation, production, investors and RD&E drivers.
- Developing a framework for Future RD&E delivery.
- Overall investment in RD&E
- Implementing the future framework.

In summary, it has as it objective, the need to rationalise the workings of the different research organisations. For each crop (eg pome fruit) there will be a lead research organisation for that crop along with support organisations for each programme within that crop. This way there should be no unnecessary duplication of focus areas.

d. Funding of RD&E

The Australians have a simple, yet extremely effective funding mechanism built on the following principles:

- Research institutes funded through the different states (provinces). This is similar to our Parliamentary Grant funding capacity (people) and infrastructure.
- All levies for horticultural are raised and managed through one agency – Horticultural Australia Limited (HAL).
- HAL is owned by the industries and run by a CEO and board and the Australian government will only match funding that is managed by HAL.
- There is a funding cap per commodity based on 0,5% of the GDP of that product.
- Government will fund 1:1 up to the cap any funding that is presented to it through HAL that benefits Australian Growers and meets with the broad parameters of Government. There is no requirement as to where this funding comes from. It could come from grower levies or the different states or from overseas. For example, the PIPS programme has leverage the funding the Plant and Food Research in New Zealand is putting into research projects in New Zealand. That funding is presented to HAL along with the levies and funding from the different states (eg Victoria) and that funding is matched by the government. The implication of this is that currently the pome fruit producers (Apples and Pears Australia Limited) are getting a 1:4 funding ratio on their dollar put into the programme.

- South Africa could present projects and be part of the Australian research programme and then get funding back.
- The HAL funding system is currently under review by a government appointed review group who have recommend halving the research funding currently flowing to the horticultural industry. This is being vehemently opposed by all the horticultural industries.

3. Apples and Pears Australia Limited RD & E Strategy

The executive summary of the APAL RD& E strategy follows on the next page. This gives the background and the priorities and strategy. A copy of the full report is available as part of the appendices of this report

a. Lessons learnt for the SA industry

- APAL started with the "Future orchards 2010" programme to stimulate the growers to get competitive in order to meet the challenge of imports.
- This was followed by the PIPS programme which was an initiative to get more integrated and co-ordinated research programmes going.
- The APAL RD&E strategy followed these two initiatives and has now taken the lead on pulling all the different initiatives together.
- The APAL RD&E strategy focuses on:
    - Defining 5 clear research programmes (Productivity and supply chain / Climate Change / Germplasm improvement (cultivar development and evaluation) / Market Access and Biosecurity and Market Research)
    - Capacity development (Industry development)
    - Programme Management (Portfolio management)
    - Extension – getting the message out as effectively to their grower base.
- This is almost a replica of our model excluding climate change and market research.

- This strategy addresses many of the issues addressed within the Fruitgro strategy but helps to contextualise the process as it links it directly into the overall Industry Strategic Plan – New Horizons 2015.
- There a very close alignment with the strategy that Fruitgro is developing.
- Fruitgro has concentrated on addressing the structure in order meet a strategy. What is required is a very clearly articulated strategy should be drafted to drive the activities that we are currently working through.
- In independent contractor was contracted to write the strategy. This person was an ex-researcher and had worked in the industry. He facilitated all the session and did all the writing. This is one of the key success factors.
- It is recommended that Fruitgro follow the same route and draft a Strategic RD & E plan for each fruit type.
    - It was part of our planning to embark on strategic planning process and gap analysis as the initial phase of the research prioritisation process.

b. Executive summary of APAL RD&E Strategy

Apple and Pear R,D&E Plan: 2010-15 Investment Priorities

Overview

In the past the R&D priorities for the apple and pear industry have been formulated and presented on a yearly basis. This approach has tended to reinforce a pragmatic decision-making approach, rather than a long-term, staged analysis to determine where investment is needed. In addition, short-term plans do not capture the changing trends and refocussing of partners' and other stakeholders' longer-term visions. Therefore, this present plan spans the five-year period 2010 to 2015. In addition, this plan is much more focused on industry development and extension activities as a driver of change; thus RD&E not R&D.

Analysis of past approaches in managing the RD&E portfolio has led to the identification of some guiding principles to help in the development and implementation of this five-year plan. Broadly, these principles include:

- The need for larger, integrated and pre-scoped projects allowing significant savings of resources and management time and appropriate planning with potential partners
- Broad agreement and effective engagement with stakeholders including the National Horticulture Research Framework (NHRN)
- Restructuring the portfolio around priority investment areas aligned to the current Apple and Pear Industry Strategic Plan, *New Horizons 2015*
- On-going assessment of performance and quality of individual projects, priority investment areas and of the RD&E plan itself
- Clarity of engagement through details set out in the plan, providing a "road-map" to potential partners/co-investors and emphasising the need to demonstrate benefits to industry

Implications for Industry and Service Providers

Larger, integrated and pre-scoped projects

- The structure of the RD&E portfolio needs revision in order to reduce the number of small projects and transform the portfolio to larger programs
- "Commissioning" of projects will mostly replace a routine annual "call" for projects
- Large projects and programs will, because of their complexity, require significant resource commitments at the scoping stage

Restructured around priority areas

- On-going projects need to be analysed and formulated into natural "groupings" that align with the strategic plan - New Horizons 2015
- Existing individual projects should be formally reviewed with the objective of ensuring they are on track and of sufficient quality; or whether they need to be adapted or even amalgamated with other projects

Assessment of performance

- All individual projects must be effectively reviewed during their lifetime
- Key projects (or sub-sets) should be subject to a comprehensive evaluation (as a separately funded & commissioned exercise)

Clarity of engagement

- the RD&E program must be accessible to a broad range of investors but maintain a high level of integrity and demonstrated benefit to industry

- All projects must be contracted with transparent probity, high quality and stringent conditions related to performance and milestone achievement

- Projects that are likely to involve commercialisation activities must contain a milestone where a commercialisation plan (including equity and route-to-market decisions) is agreed by co-investors

Portfolio Management

- Dedicated monitoring of individual projects within each priority area; including a program of "in-field" project reviews of current projects where it is considered practical and worthwhile
- Exploring and strategically analysing partner capabilities and potential opportunities in conjunction with the NHRN
- Pro-actively interacting with RD&E co-investors, particularly by dedicated involvement in project development and project management activities
- Program and project evaluation to be embedded within the planning cycle, including post-implementation evaluation of selected individual projects or sub-sets of larger programs as well as pre-implementation assessments of potential projects (to include Benefit/Cost analysis as prescribed by Council of Rural Research & Development Corporations' Chairs (CRRDCC) Guidelines)

Strategic plan highlights

The Highlights of *New Horizons 2015* are shown in FIGURE 1.

Analysis of the positioning of the apple and pear industry in the global market place highlighted that transformational change is needed. The imminent challenges facing industry are multi-faceted. They include: consumer dissatisfaction with fresh fruit; competition by other products or imports; the imminence of apple imports; and environmental impact pressures.

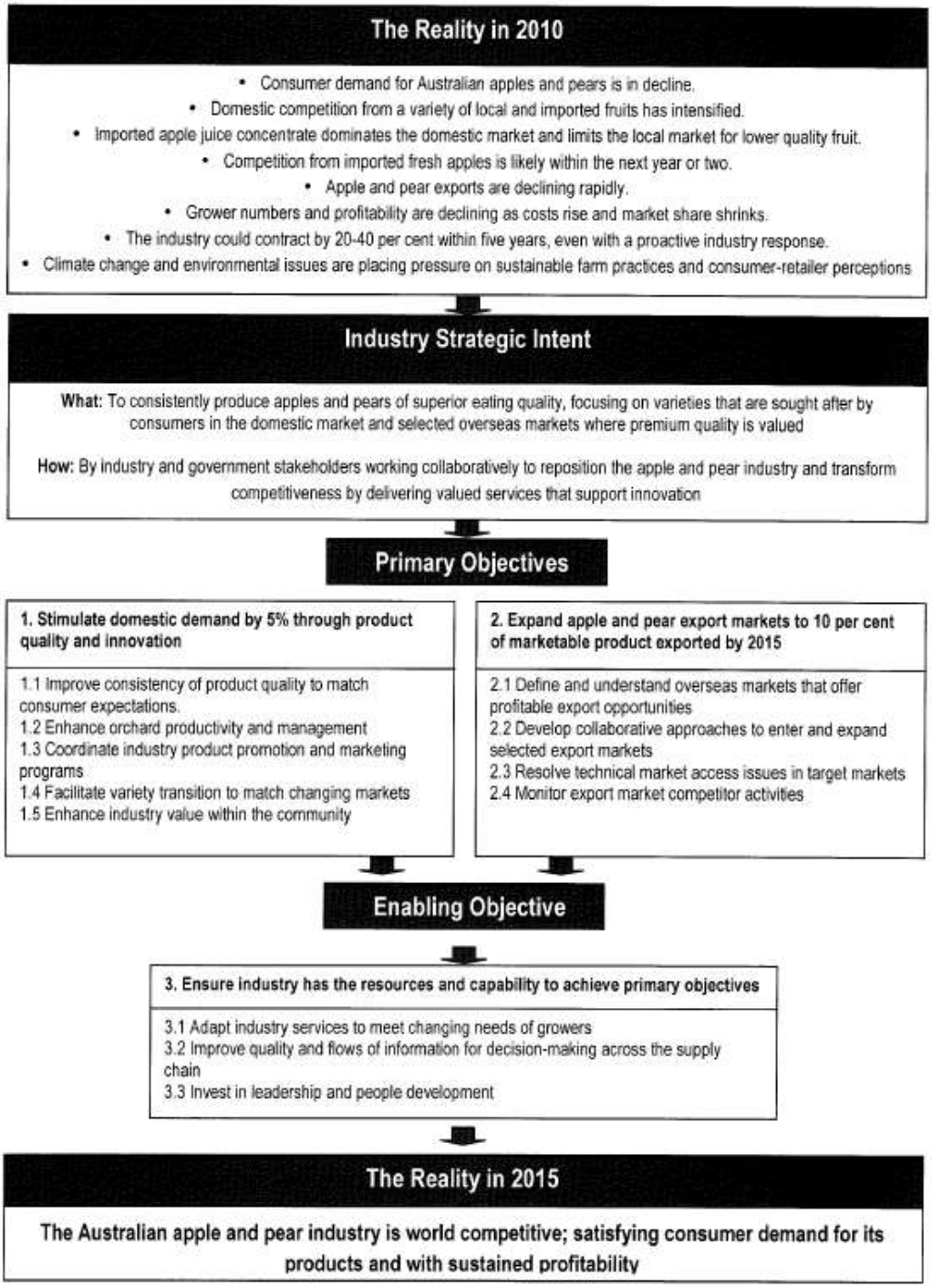
It was recognised that substantial change can only occur with effective communication and collaboration with other groups such as industry associations, governments, growers and supply chain businesses, all acting collectively.

The following three key areas for co-ordinated action have been identified in *New Horizons 2015*:

1. Stimulate domestic demand by 5 per cent through product quality and innovation
2. Expand apple and pear export markets to 10 per cent of marketable product by 2015
3. Ensure industry has the resources and capability to achieve its primary objectives

The overall objective and vision of the 5-year plan is to deliver the apple and pear industry to a status of world competitiveness, profitability and sustainability by 2015.

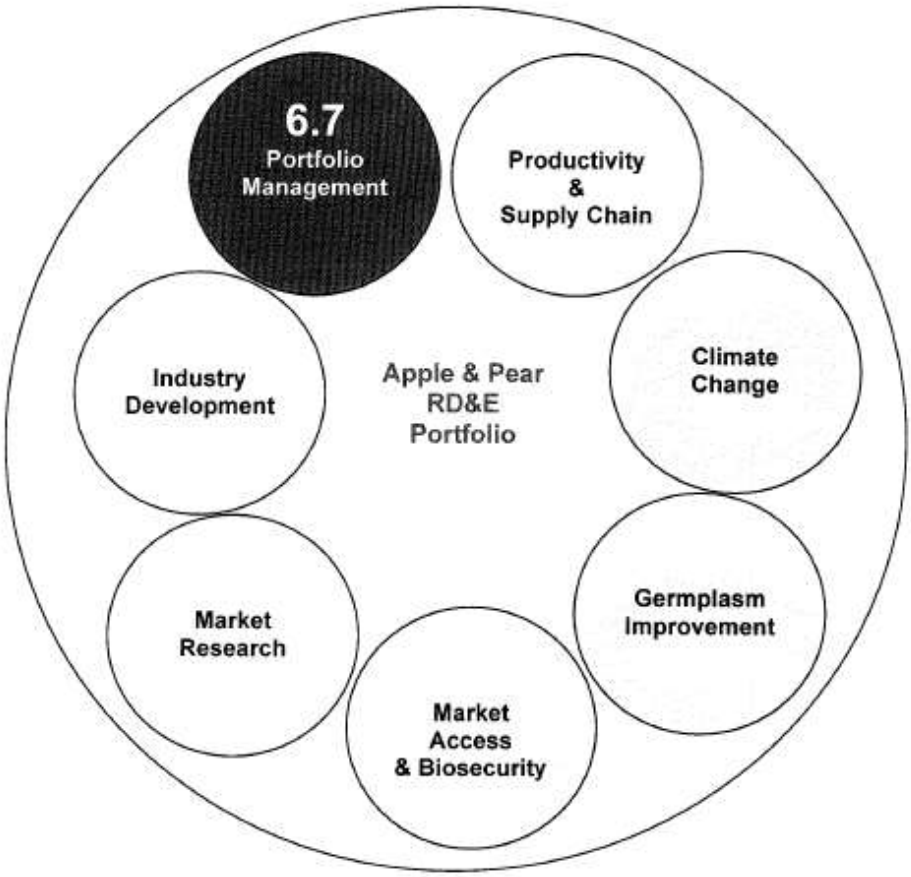
FIGURE 1 - The apple and pear industry plan on one page - *New Horizons 2015*



Investment Priorities

In this five-year RD& E plan, projects have been formulated into seven RD&E investment priority areas (FIGURE 2)

FIGURE 2 - RD&E Priority Investment Areas



Indicative budget and allocation targets

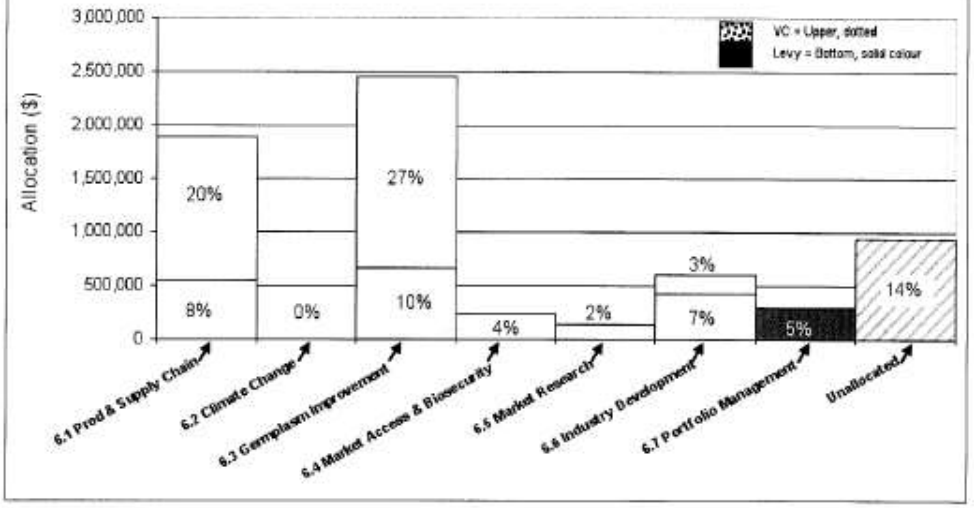
There are a number of key features of the budget starting point for the 2010/11 financial year when it is allocated according to the new priority investment areas described previously (FIGURE 6).

Firstly, the overall allocation of about $6.6m is greatly influenced by the onset of the large PIPS project and the start-up funds for the extension of the Prevar™ project (Germplasm Improvement). These two projects dominate the RD&E portfolio largely due to the high investment (as voluntary contributions) by New Zealand's PFR alongside a much smaller co-investment of levy funds.

The second key element of the starting budget is the high level of unallocated funds (14% or $0.94m). These funds have been deliberately kept aside to await the finalization of the RD&E plan in order to better guide the on-going investment.

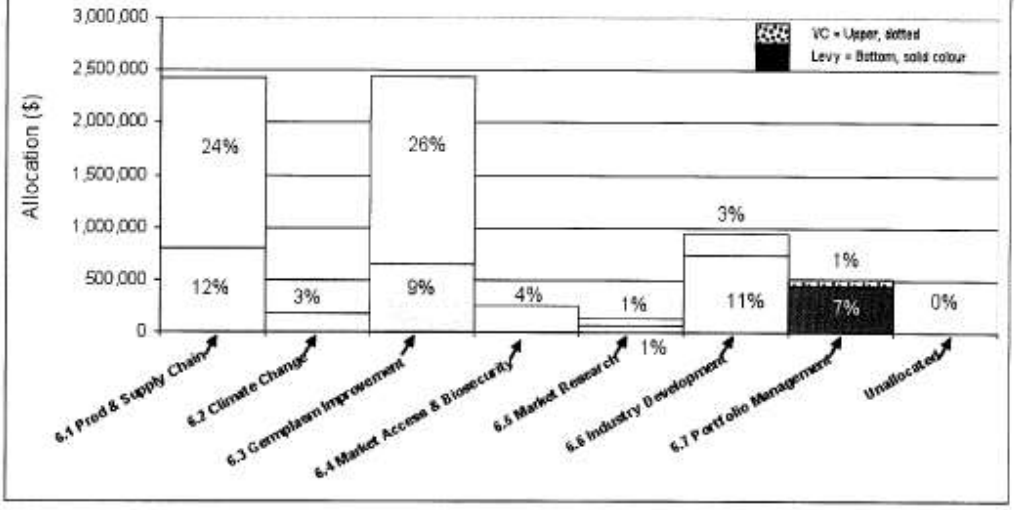
The last notable feature of the starting budget is the absence of any current allocation into the Climate Change priority area (although some aspects are covered in the PIPS project) and the absence of any voluntary contributions into the more across-industry and "public-good" areas of both Market Access & Biosecurity and of Market Research.

FIGURE 6 - 2010/11 Opening allocation into investment areas (Total $6.6m; Levy $3.3m; VC $3.3m)



In the 2011/12 financial year it is anticipated that the overall available funds will increase to $6.8m due to a targeted increase in voluntary contributions despite a small reduction in levy funds (FIGURE 7). *It should be noted that the anticipated overall available funds of $6.8m is not all available for new project funding as significant ongoing commitments to existing projects forms part of this overall funding program.*

FIGURE 7 - 2011/12 Allocation target into investment areas (Total $6.8m; Levy $3.1m; VC $3.7m)



An increased investment into the Productivity & Supply Chain area is expected largely through expanding the PIPS project and staging the introduction of a new supply chain study.

An allocation of 3% of the budget from levy funds will be targeted at a new integrated project in Climate Change.

The large allocation into Germplasm Improvement will remain at about the same level as the previous year. A proportion of levy funds will be needed to accommodate transitional changes in the pear breeding and Germplasm repository activities.

The allocation of levy funds invested in Market Access & Biosecurity is the same as the previous year. Similarly, the Market Research allocation is comparable with the previous year but an emphasis on developing export market intelligence allows the scope to lever additional voluntary contributions.

The Industry Development levy allocation will be substantially increased to represent 11% of the overall budget. The forecast challenges largely require a re-alignment and integration of industry development activities to gain efficiencies and increased focus. It is planned to re-launch the *Future Orchards 2012* project utilising a similar level of funding as in previous years.

A bigger allocation, representing 8% of the forecast budget, has been targeted for Portfolio Management. These funds are especially important in the early years of this RD&E plan as they are intended to be invested in the strategic analysis of a number of new projects areas. These new projects will, in turn, be expected to identify appropriate funding sources and co-investment opportunities.

The on-going allocation in subsequent years beyond 2012 is anticipated to remain in similar proportions to that in 2011/12. The IAC RD&E Sub-Committee has the role to monitor and manage the budget to ensure the appropriate and equitable allocation of funds into key priority areas. An area of challenge for this Sub-Committee is to help identify alternative sources for co-investment into the RD&E program including international and additional Australian Government funds.

The complete document "Apple & Pear Industry Research, Development & Extension Investment Plan 2010-2015 – Innovation making a difference" can be downloaded from:

- the HAL website http://www.horticulture.com.au/industries/Apple_and_Pear/default.asp?src=side
- or the APAL website http://www.apal.org.au/research-iac-research-priorities.cfm

If you would like further information regarding Annual Investment Priorities for the Apple and Pear Industry, please contact:

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4. Future Orchards 2012

a. What is it?

Future Orchards 2012 is an APAL managed programme designed to lift the productivity of Australian apple and pear orchards to world competitiveness.

The programme started in July 2006 supported by $1 million of funding from the Department of Agriculture, Fisheries and Forestry's Industry Partnership Program. That funding finished in June 2008 but the APAL Board agreed to continue the programme for another two years until June 2011, supported by Horticulture Australia Ltd funding.

AgFirst, a leading consultancy company from New Zealand, is again providing consultancy services to the project. AgFirst, which has specialist horticultural skills, was chosen after an international search was conducted to find the skills and experience required for the consultancy.

The main drivers of the project are 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.

b. Purpose

The purpose of Future Orchards 2012 is to provide a roadmap to an internationally competitive Australian apple and pear industry

Future Orchards 2012 goals are:

- Year 2: Australian apple and pear growers are thinking about and planning new actions in relation to intensification, product quality, international competitiveness and profitability.
- Year 5: All new plantings are intensive. Older plantings are managed to provide maximum profitability.
- Year 10: The Australian apple and pear industry is world competitive.

c. Organisational structure and funding

An industry wide steering committee was established in early 2006 to plan and continuously monitor and manage the Future Orchards 2012 programme.

The steering committee consists of:

- Chairman – APAL Director
- grower representatives from each production area
- Representative – Australia Pome fruit Improvement programme.
- HAL Pome industry service manager
- APAL General manager
- APAL Technical manager
- APAL Communications manager

Subsequently they have improved their management by:

- Using their technical manager as the coordinator and driver of the programme.
- Appointing a facilitator in each region who is often a state based extension person. This person will be paid by the programme and has the following roles and functions:
    - Administration and notification of events in their region
    - Driver in region – encourage participation.
    - Ensure presentation tailored to the specifics of the region.
    - Gather and co-ordinate inputs from growers that are required for a particular project – e.g. man hours per hectare for a specific task like thinning.
- Key success factors:
    - Relevance of the topics.
    - Over-all co-ordination and a driver in place.

Consultants

AgFirst, an independent New Zealand based consultancy company specialising in primary industry work, provides consultancy services to the Future Orchards 2012 project. It has a highly experienced team of independent horticultural consultants, many of whom have specialized in pome fruit production.

The AgFirst team has extensive experience with the methods of grower empowerment and most of the consultants working on Future Orchards 2012 have more than 15 years of consultancy experience. They have managed a large range of projects that include:

- Facilitation of the Focus Orchard Program in New Zealand for six years.

- Facilitation and management of the New Zealand National Focus Vineyard Program 2005 - current.
- Data collection, analysis and extension of the NZ Pipfruit Intensive Benchmarking Study throughout New Zealand 2004 - current.
- Production of the Pipfruit Farm Monitoring Report for New Zealand MAF 2000 - current.

Several AgFirst consultants have specialised in modern apple production systems, having gained considerable knowledge of these intensive systems from extensive travel to leading apple and pear growing regions in USA, Italy, France, Chile and Argentina.

AgFirst was the successful tenderer for phase two of the Future Orchards 2012 programme.

Budget: The budget is $180,000 (R1,260,000) per year. This funding goes mostly to the consultants and invited experts.

d. Programme

This programme has historically been a technology transfer programme – based on the successful recipe of regional field days (orchard walks) that are preceded by a short seminar on the specific theme of the day. It is now expanding to a point where small applied trials are being conducted in the field.

A web-based communication tool is being developed to capture information and act as an information / communication tool.

The following is an example of their orchard walk programme:

Field Walk	Potential Orchard Walk Topics (subject to change)	Consultants and Guests (subject to change)
Jan-Feb 2009.	• Introduction of FO2012 new project including "Orchard Business Analysis" (CH+JW) • Using the MB data to illustrate current block performance and identify key improvement strategies. (JW) • Harvest Planning, Management and Rules.(CH) • Fruit yield, colour and size. (total block and	South: Craig Hornblow Steve Tancred North: John Wilton Marvel Veens Angie Grills: (Shepparton only)

Field Walk	Potential Orchard Walk Topics (subject to change)	Consultants and Guests (subject to change)
	within tree) (MV) • Maximising fruit quality at harvest and post harvest (ST) • Pear Update (Shepparton only) Field Subjects • Inspection of Gala and early variety crops using specific monitoring blocks and their associated data. Identify best practice in each region.	
Mid June 2009	• Pruning and Training • Trellis support structures • Nutrition. (fertigation, foliar and ground applied solid) • Previous crop results using MB data. • New varieties and planting decisions	South: Steve Spark and Kevin Manning North: Ross Wilson and Craig Hornblow Angie Grills: Shep only
September 2009	• Spray Technology using Geoff Furness report • Irrigation strategies to maximise water efficiency and maximize crop • Critical growing periods throughout the cropping calendar. • Chemical thinning strategies. • Managing biennial bearing • Pollination • Vigour management • Filling the allotted space	South: Ross Wilson Paul James North: Craig Hornblow Anne-Marie Bolan Angie Grills: Shep only
November 2009	• Australian costs of production reporting. • Filling the allotted space • Crop loading / hand thinning and how to manage consistency of result • Vigour management. • Nutrition • Managing 3-4th leaf blocks vs. 1st and 2nd leaf trees	South: Steve Spark North: Ross Wilson Angie Grills: Shep only
Pre-harvest of Cripps Pink (end March beginning April 2010	• Inspection of Gala and Pear crops on the tree. • Utilisation of key MB data to demonstrate best/profitable practice • Crop yields. • Fruit colour and size. • Harvest management. • Post-harvest management.	South: Craig Hornblow Angie Grills North: John Wilton Simon Middleton Angie Grills: Shep only
June 2010	• Maximising pipfruit profit • Pipfruit business opportunities. • Pruning and Training • Discussion of the previous crop result. • New varieties and planting decisions	South: Steve Spark Monitor: Block Grower North: Ross Wilson Monitor: Block Grower Angie: Grills Shep only

The contracted consultants are present at each event – even if an international expert on a particular subject is brought in.

From 2012 it is planned to gear the process down to 2 meeting / year in each region supplemented by short meetings in peak season. The focus will shift slightly from the purely technical to more business related decisions. It will also act as a landing ground for new technologies flowing out of research.

e. Participation by the growers

- 60 – 70% of the production participate in the programme.
- Focus is on the early adopters and those willing to participate.
- In each region there is a core group of about 10% that get together before the field day and go into the detail. This is followed by the field day / orchard walk.
- Some of larger producers (e.g. Montague Farms) feel that they have not benefited as much as the smaller growers as they are generally up to date with the new technology. The main benefit that they have gotten out of the programme is the opportunity to network with some of the growers that are also pushing the boundaries – so they have someone to benchmark things against and test new ideas with.
- There has been a very strong uptake of new technologies and it has improved the vision and opportunity of those growers that are willing to go the extra mile.

f. Key success factors – what has worked well?

- The programme has led to a good networking opportunity for growers and given them a good understanding of the number that are critical for farm sustainability.
- Must have a good and passionate driver who can lead and coordinate the programme
- Local coordination in the region is critical. The right person with good contacts in the region.

- The key role-players in each region must be involved or at least support the initiative.
- The presenters must have credibility.
- The presentations must be tailored to the specifics of the region.

g. Major benefits

- The major benefit is that it has the buy-in of the growers as it is currently meeting their needs.
- APAL has gained substantial exposure through the programme and it has raised the credibility of APAL.
- It has provided a platform to communicate research outputs to the growers and will therefore lead to greater implementation of research results in industry.
- It takes the researchers and technical experts into the orchards.

h. Lessons learnt

- If you have the wrong facilitator / coordination in the regions it does not work. You need a strong person who can drive processes.
- One shoe does not fit all. Calibrate to the regional needs.

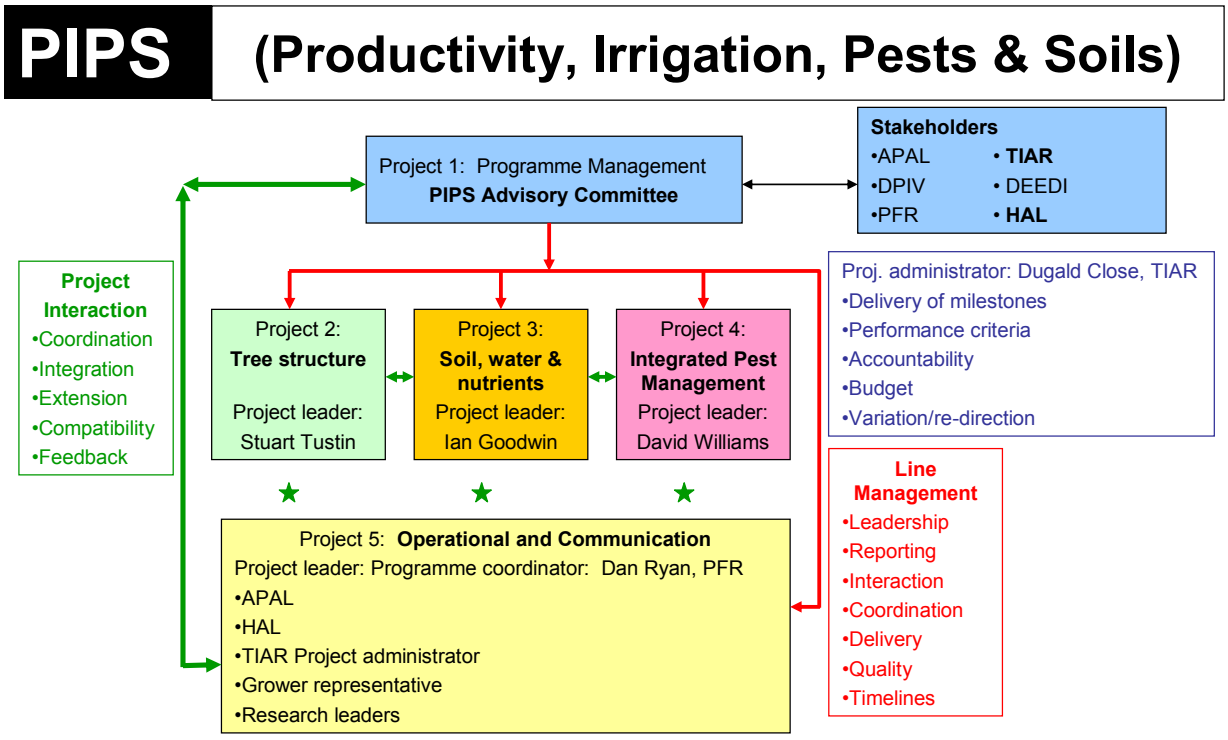
i. Implementation in South Africa

- The Australian programme is specifically focused on technology transfer in order to raise the competitiveness of the Australian grower. The fact that growers are very widespread within a region and between all the different states of Australia makes this programme of particular relevance to the Australian situation.
- The general level of orchards that we saw as the lead orchards in the industry were very impressive. All are on high density systems that are trellised with hail netting (for hail and general quality). There was a high degree of attention to detail and all the high density orchards were on dwarf rootstock – mostly M9. Fruit size seemed good (rootstock advantage) and tree growth was well managed through cropping and Regalis. The Achilles' heal of SA going to very high density orchards is rootstocks.

- Integrate the future orchards into the technology strategy under the technology transfer manager. Link each relevant programme into the future orchards.
- Explore the opportunity of registering it as a project under technology transfer and contracting a service provider to lead the process.
    - For grapes – possibly P Raath
- Link into the Technology Transfer advisory committee and set out a clear plan identifying specific events – making use of both local and overseas experts.

5. PIPS Orchard Productivity Programme

a. Overview of programme *(written by Dr Dugald Close)*



Legend:

- APAL: Apple & Pear Australia
- HAL: Horticulture Australia Ltd
- TIAR: Tasmanian Institute of Agricultural Research
- PFR: Plant and Food Research (New Zealand)
- DEEDI: Dept. of Employment, Economic Development & Innovation, Queensland

The Productivity, Irrigation, Pests and Soils (PIPS) programme (2009-14) is a national HAL and APAL flagship programme designed to integrate research effort and provide a dynamic interface with industry, through co-investment and shared management.

The programme represents a co-investment of $12 million over five years — 8.5 per cent provided by industry, 27 per cent by the Australian Government and 64.5 per cent by research agencies. Dr Dugald Close from Tasmanian Institute of Agricultural Research (TIAR) is the programme manager while Dan
Ryan of Plant and Food Research (PFR) New Zealand is the programme coordinator.

The development of a national programme centred on apple and pear orchard productivity was identified as a priority in the APAL 2005-10 Strategic Plan. Advantages of an agreed and coordinated national programme approach include:
• aligning investment by research agencies
• reducing duplication between industry and HAL
• maximising return on investment
• increasing breadth of cover
• enhancing cooperation
• improving stability of funding.

Following an APAL-commissioned survey to identify industry research priorities, APAL and HAL called for registrations of interest from research providers, which resulted in three research projects:
1. Tree structure
2. Integrated Pest and Disease Management
3. Soils, water, and nutrients

Additional projects requested included programme management and technical and industry communications. Projects are coordinated through the PIPS Advisory Committee and the PIPS Technical and Industry Communications Committee.

Tree structure

This programme area, conducted by PFR, Agri-Science Queensland and TIAR, aims to improve orchard productivity and optimise fruit quality by improving tree functional efficiency as part of the ongoing drive in development of high density orchard systems.

A secondary objective is to understand whether changes in canopy management can contribute to more efficient water use.

The task is to provide tools and methods to optimise orchard productivity, with fruit quality traits expressed to the highest genetic potential of the cultivar. The guiding principle is that optimised orchard performance depends on a better understanding of the responses of tree canopies to manipulation – manipulating structure to optimise function. This requires the measurement of how fruit quality and tree productivity are regulated by the genetic characteristics of each cultivar, and how environmental influences modify this genotypic behaviour.

New canopy management tools developed from understanding these tree structural-functional responses should guide horticultural thinking towards ideas of eco-efficient precision management of the biology of crop production. These are aimed at gains in labour efficiency, minimising resource use (especially water) and increasing opportunities for mechanisation in production systems.

The objective in year one (2009/10) was to quantify the genotypic regulation of fruiting of the important Australian-grown apple cultivars, 'Royal Gala™' and 'Cripps Pink', in three locations with differing environmental stresses - Stanthorpe (Qld), Adelaide Hills (SA) and Huon Valley (Tas). The potential new cultivar 'RS103-130' was also included in Stanthorpe.

At each location, all types of floral buds were analysed for their physiological traits at the time of final fruit set. Using hand thinning, two crop levels were set and, at maturity, harvested so that the composition of tree yield contributed by each floral bud type was measured.

External and internal quality traits of fruit from each bud type were also measured. Analysis of this data will enable the identification of bud types with the highest fruit quality potential, and the composition of typical crops according to bud type. The comparison among locations allows the measurement of how fruit development is modified by the interaction of environment factors with the genotypic traits of each cultivar.

This combination of productivity and quality analyses provides the underpinning knowledge necessary to design tree manipulations to target cropping using the best floral bud types.

Integrated Pest and Disease Management (IPDM)

Orchard pest management has been traditionally conducted on a single issue basis even to the extent of IPDM programmes for individual pests or diseases. This can lead to spray applications against one pest causing major disruption of the control of another. For example, some sprays used against thrips or codling moth kill predators that control mites and woolly aphids, necessitating further applications of expensive chemistry to bring the secondary pests under control.

The interactions between pests, new and existing biocontrol agents, diseases, pesticides and host crop plants are being studied to provide insights that will guide the development of future IPDM systems for apple and pear growers. The project is being conducted by DPI Victoria and PFR. Australian and New Zealand entomologists and plant pathologists are collaborating to evaluate a parasitoid wasp as a biocontrol for codling moth, a predatory syrphid fly for biocontrol of woolly apple aphid, and to develop a better model for informing decision making to improve management of apple scab.

A parasitoid wasp that attacks over-wintering codling moth larvae has been established in quarantine in New Zealand and is undergoing host specificity testing while an application to import into quarantine in Australia is developed. A codling moth culture has been established and is being bulked up for use at local quarantine facilities when approval to import the wasp is received.

A desktop study to identify the interactions between pests, diseases, host plants, and the biological agents, semiochemicals and pesticides used by orchardists to control them has commenced.

Current scab models from around the world have been compared and a robust model is being developed to combine the best attributes of existing models.

At least two woolly apple aphid biotypes are present in Victoria. Woolly apple aphid populations from other Australian apple-growing areas are being sampled and laboratory cultures established for studies that will characterise and quantify biotypes of the pest. These biotypes are likely to have different responses to various varieties and rootstocks, and the biocontrol agents may respond differently to each biotype.

The combination of better models to improve management of scab, biocontrol to reduce spring emergence of codling moth to levels controllable by pheromone mediated mating disruption, and enhancement of biocontrol of woolly apple aphid will reduce the need for pesticide interventions that have the side effect of killing beneficial insects that are suppressing other pests.

Soil, water and nutrients

This programme area, conducted by DPI Victoria, PFR and TIAR, aims to increase eco-efficient use of water and nutrients through improving soil health and understanding irrigation requirements in modern high-density apple and pear orchards.

The project will:

- establish soil carbon status in Australian orchards and infer trends over time
- determine the role of soil carbon in water and nutrient plant-availability
- investigate management techniques to enhance soil health
- measure and predict evapotranspiration in netted apple orchards and high density pear orchards with varying canopies and tree structures
- investigate the effects of water deficits on fruit composition.

Intensive soil samples were collected in December 2009 from two soil pits in the Goulburn and Huon valleys; soil samples were also collected along surface transects and will be used to determine soil health parameters. Nearly 300 soil samples were collected in total and are now being analysed for soil carbon levels, nitrogen content and mineralisation rates, bulk density and a range of other properties to define soil health status. The hydraulic properties of surface soils and the spatial pattern of soil strength as a function of soil depth have also been measured.

In November 2009 an experiment was established in the Huon Valley to investigate the effects of biochar on soil physical and chemical properties, soil functioning, tree growth and fruit quality.

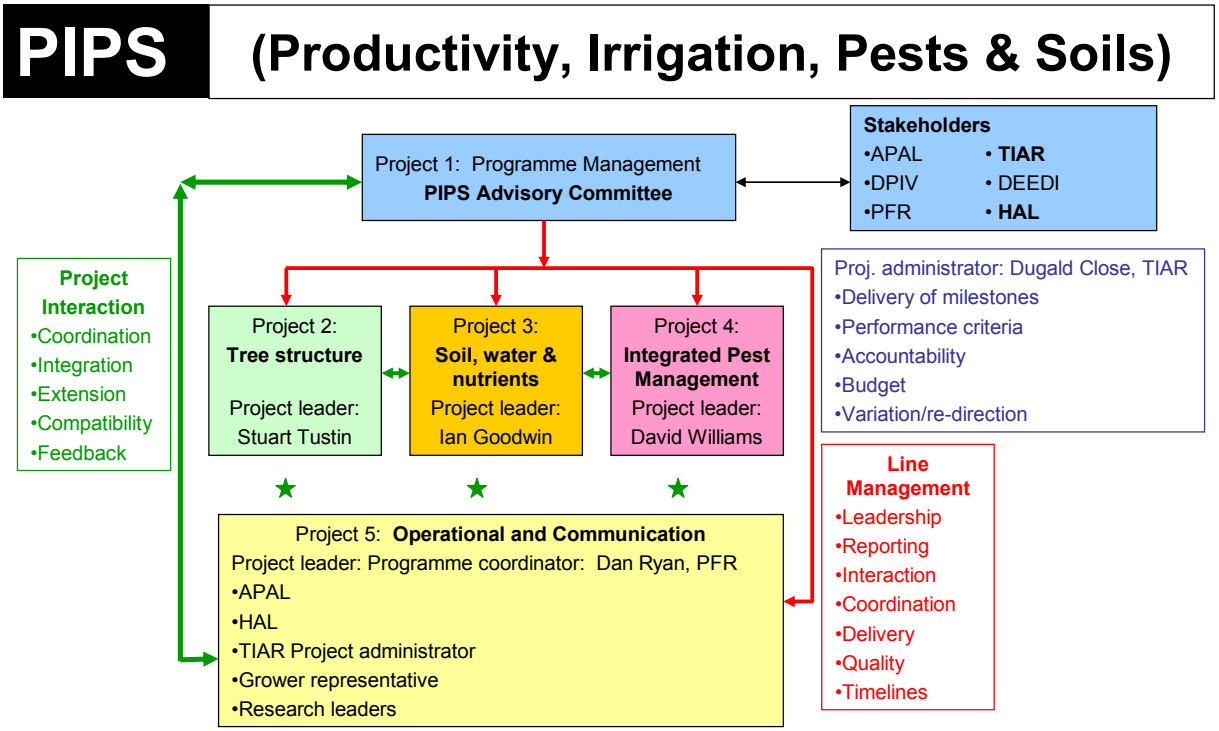
Transpiration in a netted apple orchard is being measured by sap flow and ancillary measures of radiation interception have been collected. Netting was removed during the season to observe the effect of netting on transpiration.

Experiments have been established to measure the effects of water deficits on fruit composition. The first season’s harvest data has been collected and samples are currently being analysed for colour, firmness and soluble solids.

Programme leader:
Dr Dugald Close, TIAR
Dugald.Close@utas.edu.au

b. Governance and programme management

The following diagram depicts the governance structure of the programme:



Legend:

- APAL: Apple & Pear Australia
- TIAR: Tasmanian Institute of Agricultural Research
- DEEDI: Dept. of Employment, Economic Development & Innovation, Queensland
- HAL: Horticulture Australia Ltd
- PFR: Plant and Food Research (New Zealand)

- Everything is run through projects in order to secure funding through HAL.
- The PIPS advisory committee is the board that makes all the strategic decisions and has representation of the key stakeholders. It has very clear Terms of Reference (TOR) that define what it does. *See appendices.*
    - The overall aim of the National Apple and Pear (PIPS) Advisory Committee (NAPAC) is to act as an industry/agency steering group operating in a consultative manner to ensure that the Orchard Productivity Program (PIPS) is focussed on short-term and long-term strategic industry priorities and outcomes. The NAPAC will provide strategic advice to TIAR, and through TIAR to the project leaders.
    - NAPAC members will have ***clear authority to operate*** within the TOR (Terms of reference). The appropriate higher authority for each party will sanction this.
    - NAPAC will facilitate attraction and allocation of additional resources to the overall programme, the development of spin-off projects and commercialisation should the need arise. It may consider reallocation of resources between projects if such needs arise and mutual agreement is reached by the affected

parties. NAPAC will also assist in identifying and resolving operational and/or research issues requiring attention.
    - NAPAC will be informed by and interact with the PIPS 'Technical and Industry Communications Communication' (PIPS TICC) '. The PIPS TICC will facilitate unified programme outputs to industry to for adoption and practice change.
    - The ***Parties*** are: APAL, TIAR, DPIVic, DEEDI, PFR and HAL.

- The PIPS Operational and Communications committee is the operational centre. Twice a year they look at any outputs that can be communicated to the grower base. *See appendices for TOR.*
    - The overall aim of the PIPS Technical and Industry Communication Committee (PIPS TICC) is to act as an industry/agency steering group operating in a consultative manner to ensure that the Orchard Productivity Program (PIPS) operates in a true programme manner and is focussed on short-term and long-term strategic industry priorities and outcomes; 1. Integrate research project outputs to maximise research value and relevance at the orchard system level and; 2. Transfer of findings efficiently to industry. The PIPS TICC will provide project level advice to TIAR, and through TIAR to the National Apple and Pear (PIPS) Advisory Committee (NAPAC).
    - PIPS TICC will operate under the auspices of TIAR and NAPAC and will report through NAPAC.
    - PIPS TICC will develop proposals for additional work or funding requests, where a need is identified, within the programme and provide feedback to NAPAC on addition of projects to the programme. It may recommend reallocation of resources between projects if such needs arise. PIPS TICC will also assist in identifying and resolving operational and/or research issues requiring attention.
    - PIPS TICC will be informed by and interact with NAPAC and programme members. PIPS TICC will facilitate unified programme outputs to industry to facilitate adoption and practice change.

- The Programme Manager (Dr D Close) is accountable for the outputs of the programme and he has 3 project leaders reporting to him. His key objectives are:
    - Ensuring integration of research themes
    - Delivery of milestones
    - Performance criteria
    - Accountability
    - Budgets
    - Variation / re-directing research
- <u>Funding:</u>
    - Australia creative and simple funding mechanism allows the industry to utilise any external funds to use as a lever to gain additional funds from government through HAL.
    - The funding ratios for this programme is 1:4 i.e. the levy is leverage in these ratios

c. Programme roll-out

- A steering committee led by APAL drafted the basis framework of the programme and then invited researchers / research organisations to put in proposals for Research Areas of Interest. Researcher put in their proposals and these were then evaluated.
- APAL then selected the proposals per programme that showed promise and they then invited the researchers to a meeting where that put the researchers into the 3 programmes and told them to put in a combined proposal. Each programme was allocated $130,000 and they were told to come up with priority projects to address the objectives of the programme.
- Each programme was told to elect the project leader for their programme. In each case the most senior researcher ended up being nominated.
- See *Appendices* for an example of the documents that drove this process.

d. Communication / technology transfer strategy

- There is a very strong drive on communication back to the grower
- One of the measurable outputs is the amount of information flowing back to growers – they refer to it as extension.
- They see a growing need to have this key aspect of the process clearly identified and funded.

e. Lessons learnt and relevance to the SA Industry.

- Collaboration opportunities
    - There are certainly opportunities to link in with the PIPS programme in 2 ways:
        - Collaboration – i.e. sharing of information without financial implications.
        - Present projects for co-funding (as New Zealand has done)
    - Process communicated to Programme manager is the following:
        - SA finale our strategic plan for pome fruit. Identify projects that fit into the PIPS programme and begin engaging.
- Governance and linkages to Fruitgro^{science} strategy:

- The framework used for the PIPS programme is very similar to what we are looking at in our strategy. This programme is only focused on the pre-harvest production aspect. But the structural principles are the same.
    - The advisory committee is our Board.
    - The programme manager is the same as our research manager.
    - The project leaders are the same as our programme managers for Production, Crop Protection, Quality and supply chain, Cultivar Development.
    - The Progam and Operational and Industry Development Committee is our Management Executive which includes the programme leaders, tech transfer manager and Market access manager.
- The TOR and structure that have been drawn up for the PIPS programme have direct relevance on the SA situation. These can be used as templates to draft similar document for our implementation.
- The key outcomes are the same as our programmes.
- We need to draft a simple framework that can be used to explain our strategy and structure.

6. Take home message and application in SA

- The visit and discussions that we had in Australia confirm that we are on the right track.
- We need to take the lessons learnt from the Australian programme and apply then in our strategy and ensure that our structures are correct to deliver the outcomes.
- The following actions should be taken:
    - Develop a RD&E Strategic plan for Pome and Stone and Table Grapes. This must be translated into a simple 1 pager document.
        - An outside contractor should be contracted to assist with this process.

- This process must have taken place before we go into the next project cycle in May 2011.
- In parallel with this the Future Apples / grapes process must be integrated into the process to ensure that it can be used as a landing ground for any new technologies flowing out of the research.

7. Thanks

On behalf of myself and Stephen Rabe I would like to thank the board for the foresight in sending us to Australia. I do believe that it was a very timely visit as it confirmed many of the principles and strategies that we have worked through in the past year.

We would also like to thank SAAPPA for providing the funding (as part of their research budget) that enabled us to undertake this visit.

8. Appendices.

a. Itinerary
b. List of contacts
c. National RD&E framework for Horticulture – September 2010 (available on request)
d. Apple & Pear Industry Research, Development & Extension Plan 2010 - 2015.
e. Tree structures ROIs
f. National Apple and Pears PIPS Programme Advisory TOR
g. PIPS Technical and Industry Communications Committee (PIPS TICC) TOR.

Appendices 1 – Itinerary

Day	Activity	Timing	Leader/tour guide (Accommodation)
Friday 22 October	BA6416 Cape Town to Johannesburg QF064 Johannesburg to Sydney	14:00 – 16:00 18:05 – 14:55	Self managed
Saturday 23 October	Arrive Sydney Qf453 Sydney to Melbourne A3	14:55 17:00 – 18:35	Self managed _____
Sunday 24 October	Trip to Marysville Return to Yarra valley for lunch & possible tours of vineyards Back to hotel in Melbourne for dinner	Morning Lunch/afternoon Evening	Kevin Sanders, Megan _____
Monday 25 October	Visit Kilmore and Tatura. David Williams Ian Goodwin on ground PIPS work staff at dpi Vic. Visit to Andrew Plunkett and Geoff Karl. Arrive back Melbourne for dinner	Morning and afternoon Evening	Self managed _____
Tuesday 26 October	Visit Montague's (Rod Taylor, 0417306307) Visit Sanders (Ybarra valley, visiting home orchard) Dinner – Yarra valley	Morning Afternoon Evening	Self managed
Wednesday 27 October	Visit growers on the "future orchard 2012" programme; Ian Armour (HAL) Lunch (Witchell) Fankhauser Dinner in Gippsland or Melbourne	Morning Lunch Afternoon Evening	Kevin Sanders & Richard Hawkes _____
Thursday 28 October	Apple & Pear Australia (APAL) Lunch APAL continued QF6822 Melbourne to Hobart	Morning until 12:00 12:00 – 13:00 Afternoon 19:00 – 20:15	Richard Hawkes, Tony Russel, Stuart Gray Bradley Mills _____
Friday 29 October	Dr Dugald Close, (Programme manager for PIPS programme) Hobart Univ. Tasmania 09h00 – 12h00 room 307 School of Agric Sciences Garry Langford APFIP (Lunch in Huonville) _____	09:00 – 12:00 Lunch Afternoon 12:00 – 15:50 16:50 – 18:05 19:05 – 20:15	Dugald Close _____

Appendices 2 – List of Contacts

Name & Position	Organisation
Dr Ian Goodwin Senior Research Assistant: Horticulture & Viticulture Physiology	Dept. of Primary Industries Victoria
Chris Peters Manager: PIDO project	Fruit Growers Victoria
Brian & Shaun Witchell	Golden Apple Orchards Labertouche, Victoria
Glynn & Brad Fankhauser	Fankhauser Apples Drouin, Victoria
Brad Mills Industry Services Manager	Horticulture Australia Limited, Melbourne, Victoria
Brad Wells Plant Health Manager	Horticulture Australia Limited, Melbourne, Victoria
Tony Russell General Manager	Apple & Pear Australia Ltd., Melbourne, Victoria
Richard Hawkes Technical Manager	Apple & Pear Australia Ltd., Melbourne, Victoria
Dr Dugald Close Perennial Horticulture Centre Leader	Tasmanian Inst. Of Agric. Research
Garry Langford Manager: Major Projects	Coregeo (A division of APAL), Tasmania
Mark Hankin Operations Manager	Australian Pome Fruit Improvement Programme, Tasmania