Horticulture Innovation Australia

Final Report

Australian Pome Fruit Improvement Program Limited 2011 - 2016

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Australian Pome Fruit Improvement Program Ltd.

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Summary

This project builds upon earlier projects starting in 1996. The focus has been on independent evaluation of new varieties, certification of planting material (varieties and rootstocks) and improvements to the plant quarantine system for pome fruit planting material entering Australia. These activities provide growers with the opportunity to improve their profitability by having good variety performance information to assist with decision making on what to plant, availability of high quality nursery stock that deliver higher yields of quality fruit, and ready access to new varieties which are the life blood of a vibrant industry.

During 2014, as part of the current project, an independent review of the Australian Pome Fruit Improvement Program Limited (APFIP) was completed by Dr. Bryan Whan. The excerpt below is an independent summary of the APFIP's work taken from Dr. Whan's report.

By the end of the current HAL project, APFIP will have been operating for 20 years with an overall investment of just over $4.7m.

The program has been a great success, and those involved, including the industry leaders with the original foresight to initiate the program and the staff and management who have championed its cause, need to be congratulated. In particular, Garry Langford needs to be commended for his commitment and vision in leading the program since its inception. In a strategic context, the program has changed industry attitudes and provided direction in critical areas that were obvious limitations to the profitability of the apple and pear industries. The level of productivity of Australian growers was behind their international competitors, and this program has developed and implemented processes that will assist growers to close this gap by improving tree health through a certification scheme and delivering better varieties quicker through a variety evaluation system and improved quarantine.

The biggest challenges faced by APFIP were changing industry attitudes and encouraging the nurseries and growers to interact more effectively. Some industry attitudes were quite entrenched, and while it will take considerable time for the changes to be completely embraced by the industry, there have been significant improvements as a result of the APFIP initiatives.

During the life of the current project:

- 15 new varieties have been evaluated,
- 60k certified nursery trees and rootstocks have been planted into new orchards,
- the time for new pome fruit planting material to pass through the plant quarantine system and be made available to the Australian industry has been further reduced from 18 months to just 1 year, and
- 45 new pome fruit cultivars have been imported into the Australian Post Entry Quarantine (PEQ) system in 2015, of which 13 apple varieties, 2 pear varieties and 1 pear rootstock have been cleared for APFIP evaluation for use in Australian orchards.

To be successful APFIP has had to change industry standards, practices and perceptions. This has been achieved by working closely with the industry and providing excellent plant material, knowledge and advice. That said, there is more to be done to completely bed down the certification process. This will be achieved by demonstration to the industry of the clear benefits that can be achieved.

Introduction

The Australian Pome Fruit Improvement Program Limited (APFIP) 2011-2016 is a project funded by HIA and is undertaken by the Australian Pome Fruit Improvement Program Ltd., which is a not-for-profit company established by the Australian Apple and Pear Growers Association (AAPGA) now Apple and Pear Australia Limited, for the benefit of the pome fruit industry in Australia.

Industry Funding of APFIP

APFIP was established following a motion at the 1994 annual conference of the Australian Apple and Pear Growers' Association (AAPGA). The motion approved a levy of 1.5 cents per 18kg carton to be added to the apple R&D levy and this was to be administered by the Horticultural Research and Development Corporation (HRDC) now Horticulture Innovation Australia Ltd (HIA). The levy increase did not apply to the pear R&D levy. Until the formation of Hort Innovation Australia Limited in November 2014 its predecessor Horticulture Australia Limited (HAL) accounted separately for the portion of the apple R&D levy set aside for APFIP.

APFIP Ltd was formally registered as a company limited by guarantee in February 1997. Neither the AAPGA nor APAL placed any time limit on APFIP nor specified any need for it to become self-funding. A definition of 'self-funding' of 75 per cent commercially derived income and 25 per cent from then Horticulture Australia Limited (HAL) in matched funds was agreed between APFIP and HAL in 2002. The APFIP portion of the apple R&D levy was reduced by 33 per cent to 1 cent per 18kg carton on January 1, 2002, as part of the process for APFIP to be less reliant on industry funding. APFIP has operated on HRDC, HAL and Hort Innovation projects that utilize the funds set aside from the apple R&D levy since 1996.

A series of business plans have been developed and implemented over the life of the projects and the current focus is detailed below:

Vision

That the Australian pome fruit industry will benefit substantially from

- the latest variety nursery trees, prepared from certified propagules, being in ready supply, and
- excellent technical information on new varieties

Mission

1. To introduce prompt and secure access to new pome fruit varieties and rootstocks through efficient post entry quarantine protocols. (***Quarantine***)

2. To develop and deliver to the Australian pome fruit industry independent and objective variety/rootstock information. ***(Evaluation/Tree Procurement Service***)

3. To deliver confidence in tree selection by promoting and managing an efficient and effective certification scheme for the Australian pome fruit nursery industry. (***Certification***)

Objectives

The broad aims of APFIP are:

- Work with authorities to minimise quarantine times to provide fast access to imported varieties
- Give growers tree purchasing confidence via independent certification of nursery trees and rootstock
- Improve growers' ability to choose most appropriate variety for their situation through the provision of variety evaluation information
- Improve growers' awareness of nursery tree options and help specify the trees they want – certified/non certified, rootstock, architecture
- Empower growers in their negotiations with nurseries, particularly with respect to setting detailed specification of the tree requirements
- Improve interactions between growers and nurseries
- Promote value of certification to growers and nurseries

Importance and relevance of objectives

Currently, commercial nurseries dominate both pome fruit tree production and the supply of information about the performance of new varieties. APFIP-certified propagules meet world-class specifications and its evaluation program is more sophisticated and objective than similar programs overseas. However, APFIP must continue to develop its relationships with nurseries, variety owners and growers to change the dominant influence nurseries currently have on the standard of trees and information on new varieties. Failure to do this for commercial, political, or any other reasons will result in the nursery-dominated status quo remaining.

Secure and rapid post entry quarantine (PEQ) procedures directly impact on the profitability of all growers by providing prompt access to the latest varieties available to international competitors and ensuring these are sourced from licenced/authorized and reputable suppliers, thereby reducing the occurrence of opportunistic and deliberate illegal imports by those wishing to capitalize on unmet demand, and the associated risk of exotic pests and diseases.

Background

Research conducted in Australia and in Europe has clearly demonstrated that nursery trees that are not infected with a number of key viruses outperform nursery trees that are infected with viruses.

State government support for extension services that provided the Fruit Variety Foundation in the 1970s disappeared in the 1980s and early 1990s. Although virus testing for stone fruit trees has been the norm for many nurseries for many years, there has been little interest from the nursery industry in providing certified pome fruit trees to growers.

APFIP has developed a certification system for the Australian pome fruit industry based on a certification trade mark which is licensed to nurseries that meet specified criteria. Planting material is certified as tested negative for the viruses of economic significance (apple mosaic virus, apple chlorotic leaf spot virus, apple stem grooving virus and apple stem pitting virus), true to type and meets minimum physical requirements. There are now 11 nurseries licensed to use APFIP's certification trade mark producing 450-500,000 rootstocks per annum and in 2016 50k certified nursery trees.

The introduction of global rights for plant varieties via Plant Breeders Rights (PBR) in the 1980s provided recognition of the value of the intellectual property that was developed in new plant varieties. This changed the way growers in particular accessed varieties. The industry until that time was built on "public varieties" and meant that all sectors of the market could grow, market and sell the varieties without restriction. Global production is still dominated by these "public varieties". Although some derivations of them have now been protected by PBR, this has usually not resulted in any planting or marketing controls.

The very successful Australian variety Cripps Pink has been protected by PBR in most territories around the world and through the use of the Pink Lady® trade mark has changed the way that new varieties are introduced. The Pink Lady® marketing program has resulted in significant premiums on fruit prices being delivered over a sustained period of time. All those seeking to develop new apple and pear varieties are building on this model.

In the light of this the variety owners/managers need independent information about the performance of a new variety in each climatic area to assess whether or not it should be commercialised in that area. By having access to independent performance information, growers will be able to make an informed decision on whether a new variety suits their conditions without being solely dependent on information from the variety owner.

APFIP provides an efficient, independent and secure evaluation service through its eight sites across Australia.

In the light of changes to the way varieties are being managed globally it was going to be increasingly difficult for Australia to be part of the international variety scene if it took three to four years to import them through quarantine into Australia. There had not been any review of the importation protocols for pome fruit for 25 years prior to the review completed in April 1998 as HRDC project AP627 (J. Moran et al.).

The subsequent completion of a review by AQIS in February 2002 based on AP627 opened the way for a reduction in the time new varieties and rootstocks needed to spend in quarantine. This was via

increased active testing for a range of diseases as opposed to the passive testing under the old protocol. With a revised quarantine period now of just 12 months Australia is able to consider itself a participant in the international variety scene. The benefit to growers is by way of prompt access to new variety opportunities.

APFIP has continued to be involved on the Post Entry Plant Industries Consultative Committee (PEPICC) of AQIS, this role is undertaken by the Evaluation Coordinator. The PEPICC advises AQIS on quarantine matters, so this is an important role which enables APFIP to maintain contact with and influence AQIS on issues that affect pome fruit imports.

The new Post Entry Quarantine station is now commissioned at Mickleham in Victoria. This station now replaces previous PEQ stations in Victoria, New South Wales and Tasmania. Such changes, within AQIS, are largely beyond the control of APFIP and this project.

Methodology

The key aspects in the justification for the methods chosen to address the project objective were:

- In completing its objectives APFIP resolved to not duplicate industry infrastructure where it already existed, and
- For the focus to be on creating capability and then enabling delivery in the most efficient and cost effective manner.

A. Certification:

Background:

Almost all of the countries that compete with Australia in international markets have propagule certification systems, with many of these based on government legislation. In the majority, these systems certify the planting material for virus status and trueness to type. Given that the industry in Australia is quite small by global standards (0.5 per cent of world production) and that Australian production is spread over the six Australian states, a national legislative approach to certification was seen as having a low chance of success. A failure to achieve a certification scheme in all states would severely handicap the outcomes of the service.

The USA and New Zealand have industry-operated systems with involvement voluntary but with operating costs recouped from the purchase of certified products. The USA system covers both rootstocks and scion varieties; the NZ system applies to rootstocks only.

A voluntary system was considered, but rejected on the basis that introduction and management would be difficult as there would be no means to control nursery claims of compliance.

Based on legal advice APFIP resolved to pursue a certification trade mark to deliver its certification objective. The trade mark development process was described in HAL project AP00026 and the trade mark is presented at Figure 1, below.

Figure 1: APFIP Certification trademark symbol (No:964237)

Key Certification Requirements:

The APFIP certification system is based on the use of a nursery tree tag that displays the APFIP certification trade mark (Figure 1) on all finished nursery trees that meet the Certification Scheme's requirements. The trade mark is to be used by APFIP's approved users to indicate that the following key requirements have been met with regard to finished nursery trees and rootstocks. The development of the trade mark was described in HAL project AP00026.

Trueness to Type: Budwood/scionwood production trees must be fruiting.

Controlled production conditions: All certified rootstocks and nursery trees must be segregated from non-certified rootstocks and nursery trees (in the field by 30 metres).

Varieties and rootstocks must test negative for the following viruses (these are all endemic in Australia and of economic significance): Apple Mosaic Virus (ApMV), Apple Stem Pitting Virus (ASPV), Apple Chlorotic Leaf Spot Virus (ACLSV), Apple Stem Grooving Virus (ASGV), Apple Rubbery Wood (MLO).

Trace Back: All certified planting material is entered into the APFIP certification database. An individual number given to each finished nursery tree.

Finished nursery trees and rootstocks are to be free of these Pests and Diseases: Apple Scab, Powdery Mildew, Woolly Apple Aphid

Finished nursery trees and rootstocks must meet Minimum Nursery Tree Requirements: Standards described for one-year-old finished nursery trees and two-year-old finished nursery tree and rootstocks.

Licensing of the APFIP Certification Trade Mark:

The certification trade mark was granted by IP Australian on the 27th of January 2005. APFIP began its efforts to license the use of the trade mark immediately.

Expressions of interest were sought from the industry through advertisement in the industry journal Tree Fruit and by direct approach to nursery entities. Use of the APFIP certification trade mark (Figure 1) is licensed to nursery entities and displayed on the tree tags used on finished nursery trees and rootstocks that meet the certification trade mark requirements.

Licensee Selection Criteria: Potential licensees are required to make an application to APFIP addressing the key criteria listed below. Acceptance of an application by APFIP is based on the applicant's ability to meet the criteria. Unsuccessful applicants are able to reapply once identified areas of deficiency have been addressed.

Criteria (as per Schedule 5 of the rules)

- Capacity/Infrastructure - nursery has the infrastructure to professionally propagate trees
- 10 Years' experience - nursery is experienced in tree production

- Integrated Management System
- Financial status - nursery is financially sound
- Industry Commitment - industry has a commitment to the apple and pear industries
- Vision - nursery shows vision for the future
- Not in Default
- Licences - nursery deals in new varieties etc

Use of the Certification Trade Mark on Nursery Tree Tags:

Use of certification trade mark and responsibility for the product rests with the licensee. APFIP provides tree tags that have the certification trade mark and the disclaimer noted below on the reverse side. The licensee is able to print their details and the tree information on the other side of the tag. Tree tags are placed on all certified trees.

Certification Disclaimer:

""The purpose of the Trade Mark is to certify that the trees and rootstocks sold by the nursery to you are:

- *Able to be traced back to their nuclear stock tree.*
- *Have tested negative for specified Viruses, and*
- *Have been grown and maintained in specific and controlled conditions.*

APFIP does not accept any liability in respect of a failure by the nursery to comply with the APFIP Certification Trade Mark Rules.""

(Attachment 1- Certification Rules and Licence.)

Heat Treatment Process:

The ability to heat treat plant material where viruses have been identified is integral to the certification system. The objective is to produce 4 heat-treated trees of each selection. The viruses that infect pome fruit trees can be difficult to eliminate so this number is required to ensure that at least one of the trees tests negative for all the viruses at the completion of the process. This system operates in conjunction with a virus indexing service. Crop Health Services, a division within the Victorian Department of Economic Development, Jobs, Transport and Resources (DEDJTR), has developed these services on an ""on demand"" basis. See Figure 2, below.

Certification Database:

A secure online database has been established to track all certified plant material. The database is hosted by Netconstructs in Adelaide and is backed up daily in a location remote from the server. Its current web address is <www.cert.APFIP.com.au/loginpage.aspx>. Only the licensees and APFIP have access to the database. The database provides trace back for individual finished nursery trees and rootstocks. Information related to all aspects of the history of each variety and rootstock is stored in the database along with its virus testing results and trueness to type assessments. The database creates the batch numbers for each finished nursery tree tag that links back to its original source. APFIP is able to audit licensee activity.

Creation of Foundation Certified Rootstocks & Varieties:

APFIP has used the heat treatment process to create a nucleus supply of certified rootstocks & industry standard (non-proprietary) varieties. Rootstocks are the foundation of the certification system and these have been initially bulked up in APFIP's repository at Cambridge in Tasmania. Certified rootstocks have been distributed to APFIP certification licensees for further bulking up and commercial production and sale. The heat-treated varieties were planted in the APFIP repository for trueness to type testing prior to distribution to licensees.

The APFIP repository is a secure area leased from the University of Tasmania, the lease is a rolling lease and was re-signed in 2015.

Figure 2: Heat treatment process

Certification: heat treatment flow chart

The entire process takes approximately 18 months

Pathogens tested for : Apple mosaic virus (ApMV), Apple chlorotic leafspot virus (ACLSV), Apple stem grooving virus (ASGV), Apple stem pitting virus (ASPV), Apple rubbery wood MLO.

Certification of Proprietary Varieties APFIP is not a variety manager or a licensee. There is a significant range of new varieties available in Australia and APFIP is not able to certify every new variety itself. This means that certification of these proprietary varieties is something that APFIP has to encourage its licensees to undertake. To achieve this APFIP focused on creating demand for certified trees within the industry and thus creating a commercial incentive for the variety owners to have their varieties certified.

Nursery Tree Quality Nursery trees that meet grower requirements are integral in achieving early and sustained production in new orchards. APFIP has developed a comprehensive nursery tree specification and tree types description (Attachment 4). This was developed and circulated widely in the industry to assist both growers and nurseries to better cater for one another's needs with regard to finished nursery trees. Anecdotal evidence suggested that growers did not readily understand the terminology used by nursery tree producers and nursery tree producers did not understand grower requirements, particularly branching heights.

B. **Evaluation:**

Background:

The introduction of Plant Breeders Rights (PBR) during the 1980''s resulted in the Australian state departments of primary industry/agriculture systematically closing down their variety evaluation programs. Government policy across the states decreed that they were not permitted to evaluate proprietary varieties. The state departments had been the chief source of new variety information until this time. Their variety planting recommendations were actively sought after by growers.

New variety evaluation then became the domain of the proprietary variety owners and their agents. The lack of independent variety information was identified by the pome fruit industry in the early 1990s as being a significant issue to overcome.

Given that the state departments were not able to be involved and the established nursery networks were not able to provide independent new variety performance information, an independent industry-operated system became the logical option to pursue. The establishment of the APFIP evaluation system was described in HAL projects AP96035 & AP00026.

The APFIP evaluation network is based on the key principles of security, independence, efficiency and relevance.

Security All the material that is entered in the APFIP network is proprietary. Confidentiality agreements are completed with all involved. Public access is not allowed to evaluation sites. All sites are on private land as part of commercial orchards. Varieties are entered under an APFIP alphanumeric code; the variety identity is not known to anyone associated with the evaluation sites.

(Attachment 2- APFIP Evaluation Deed)

Independence. APFIP is not a variety owner/manager or licensee. APFIP does not make variety recommendations. This ensures that APFIP is not conflicted in its data collection and subsequent dissemination of information.

Efficiency APFIP provides overall coordination of all evaluation activities but it engages observers for each site as data collectors. APFIP provides support and assistance to its regional custodians who host the trees in their commercial orchards and provide the day-to-day care and maintenance.

Relevance The evaluation network is designed to provide a snapshot of local performance of varieties. The sites are part of commercial orchards. Sites are located on the basis of advice provided by the evaluation coordinator. Varieties are removed from the sites after 7 years, or earlier at the request of either APFIP or the owner. There are 4 to 6 trees of each variety placed in sites selected by the owners. The data collected needs to reflect both the grower and variety owner's needs.

(Attachment 3- APFIP Evaluation DL)

Evaluation Operations Each site is established on a grower property. The grower who hosts the site is an APFIP Regional Custodian and completes an agreement with APFIP to provide maintenance services. Each site is supported by a group of local growers and they become APFIP Regional Evaluation Group members. Regional Evaluation Group members also complete an agreement with APFIP. The group members support the custodian with site activities such as fruit thinning and also participate in the post-harvest fruit tastings. Each site has a contracted Observer (who also completes an agreement with APFIP) to collect site data and enter it into the online database.

(Attachment 4- Custodian Agreement)

Site Procedures An Observer's Manual has been developed along with a number of site operation procedures, these are;

- Tree planting & removal
- Trellising
- Irrigation
- Fertilizing
- Chemical applications (no chemical fruit thinning)
- Pruning & Training
- Thinning

All data collection forms, the observer's manual and site operating procedures are controlled. The originals of each are stored on the secure APFIP evaluation database.

(Attachment 5– Observer's Manual)

APFIP Secure Online Evaluation Database The APFIP evaluation database was established during HAL project AP00026. The database is hosted by Netconstructs in Adelaide. It is backed up every day on a site remote from the server. The secure site address is https://evaluationnew.APFIP.com.au .The site is accessed via unique user names and passwords. These allow access to quite specific areas of

the database. Variety owners can see “live” information, as it is generated, of the performance of (only) their varieties. Data collectors can only access details of trees in the site assigned to them. Regional Custodians and Regional Evaluation Group members can access just their site plan along with the operational procedures. APFIP has overall administration control of the database.

Three seasons data is required before APFIP seeks authority from the variety owner to publish the information. Reports can be generated from the database in the areas of dormant observations, flowering, fruit set, pre and post-harvest observations and maturity timing, fruit size and shape, taste, pest and disease susceptibility and tolerance and photographs.

(Attachment 6– 2016 Variety Report)

Weather data loggers are installed in 6 of the 8 regions (Manjimup W.A., Lenswood S.A., Stanthorpe QLD, Orange NSW, Ardmona VIC, Huon Valley TAS) where APFIP has evaluation sites. The information is important as it provides owners and growers specific weather context for the feedback on performance of the variety. The information from the data loggers can be accessed online 24/7 at weather.APFIP.com.au. Monthly reports are published both on the APFIP website and in the *Industry Juice* electronic industry newsletter published weekly by APAL.

Weather data covering temperature, rainfall, humidity, wind speed, soil temp, chill units, degree days, frost hours, evaporation and apple scab prediction modelling is all accessible.

Target Varieties for the Evaluation Network For maximum relevance APFIP targets varieties at their pre commercial stage so that the information collected can be used to inform the decision of whether or not to commercialize. If commercialization does occur, then the information can be used in the development of the fruit specifications.

C. **Quarantine**

Background:

Post entry quarantine (PEQ) is a sovereign process, that is, the government of Australia decides by what process plant material enters the country. The policy for this process is set in line with international treaties to which Australia is a party.

No significant review of the pome fruit importation protocols had been completed in the period 1970 to 1996. The HRDC project AP627 (*Proposed Post Entry Quarantine Protocols for Pome Fruit J. Moran, B. Clarke & J. Urquhart)* completed a review of these protocols. This project formed the basis of the AQIS report “*Review of Post Entry Quarantine Protocols for the Importation into Australia of Apple (Malus) and Pear (Pyrus) Budwood”* completed in February 2002.

There is no opportunity for direct industry involvement in the quarantine process. The approach chosen by APFIP is to be closely engaged with AQIS to facilitate the introduction of new testing protocols as they become available. This engagement has been described in HAL projects AP96035 and AP00026. The APFIP Evaluation Coordinator represents the industry on the AQIS Post Entry Plant Industry Consultative Committee.

Post Entry Quarantine Protocols:

Pome fruit bud wood is classified as a high-risk plant import, all importations must pass through a high security plant quarantine station. The commonwealth and state governments are the only entities currently accredited to host high security plant imports.

Any changes to testing protocols for the exotic pest and diseases that might accompany pome fruit budwood imports require the approval of the Australian Quarantine Inspection Service (AQIS).

Scientifically robust and verifiable testing protocols will be considered by AQIS for inclusion in the protocols. APFIP was a direct investor in HAL project AP01030 "Improving Plant Diagnostics" that sought to develop new protocols for viroid tests and also fire blight testing. APFIP encouraged voluntary contribution to this project from industry users of the quarantine system.

Current Pome Fruit Budwood Import Conditions:

The conditions applying to pome fruit imports can be found in the new Biosecurity Import Conditions (BICON) database accessible via the AQIS website http://www.agriculture.gov.au/import/online-services/bicon

D. Tree Procurement Service (TPS):

Background:

The Australian pome fruit industry has long faced issues around availability and quality of nursery trees. Growers have for some time found it hard to liaise with and form relationships with tree nurseries, and complain that nurseries have failed to really understand growers and their needs and requirements when planning new development and purchasing trees.

Growers were in some cases continuing to plant poor quality trees, unaware of what had been delivered. This only contributed to more disappointment with new planting and poor return on investment.

Growers contributed to the problem, with poor feedback to the nurseries on their tree type requirements contributing to the nurseries' lack of understanding of grower needs. A failure of some growers to recognize the cost of producing trees and to honour purchasing commitments contributed to a distrust between the sectors. Growers must be prepared to pay deposit payments and demonstrate to the nursery they are committed to orders and won't leave the nursery standing at the last minute with an order of trees and no customer.

Prior to the advent of APFIP, the information-relay gap between growers and nurseries had seemed to be getting bigger, prompting concerns of increased issues with tree suitability and return on investment at an orchard level

In a bid to bridge the gap, it was decided to develop and implement a Tree Procurement Service (TPS). This service would allow growers to approach APFIP and ask for help in planning their new developments and sourcing nursery trees to suit their requirement. APFIP would serve as an independent service manage information between the two parties so all requirements were fulfilled, and each party's expectations were met.

(Attachment 7- Tree Procurement Service DL)

Outputs

APAL and Hort Innovation addressed a new approach to variety improvement, evaluation and certification as described in the Variety Improvement Project of the apple and pear R&D Investment Plan *"Innovation making a difference".* In the end it was decided that no change would be made and APFIP would remain responsible for evaluation, quarantine and certification services and that other services would be added to the APFIP portfolio.

A. **Certification Services**:

Certification of plant material into the Australian apple and pear industry is still a core focus of APFIP. Building relationship with grower's nurseries and the promotion of the value of virus-certified material is still the key to adoption of this kind of system.

(Attachment 8- APFIP Certification DL)

APFIP now has a certification system delivered to industry. Within this system there are 10 identities licensed to use the nursery tree certification tree tag. These licensees combined would produce approximately 80% of the apple and pear nursery trees produce annually.

Bazzani Holdings (Olea Nursery)	Manjimup WA
Tahune Fields Nursery	Huonville Tas
Tangara Nursery	Grove Tas
Balhannah Nursery	Lenswood SA
TopStock Investments	Red Hills Vic
Top-Qual Pty Ltd	Sidmouth Tas
Lenne Orchards	Ardmona Vic
Mount View Orchards	Batlow NSW
Little Tree Company Nursery	Shepparton Vic
Narromine Transplants	Narromine NSW
Galgate Nursery	Stanley Vic

These licensees have invested heavily into the establishment of certified mother beds of rootstock and cultivar budwood.

APFIP hopes to continue to license remaining nurseries as well as individual growers that produce their own nursery trees, enabling them to access far healthier plant material into the future.

Besides the operation of the normal certification service, new developments implemented were:

- the planting of the Certification Demonstration Sites.
- the launch of the APFIP Tree Procurement Service (TPS).
- finalization of the certification database

For growers to appreciate the value of certified trees it is important that they can "see with their own eyes" the differences in growth, production and fruit quality that propagation with certified materials makes. To this end APFIP has planted a series of Certified Material Demonstration Sites.

The concept for the site is a comparison of:

- trees propagated using APFIP-certified propagules in an APFIP-certified nursery; with
- "normal" trees (not produced from certified propagules).

APFIP decided that the trial design would be to plant 300 (a small, commercial block) certified trees at a single, high profile, site with a similar number of trees propagated from non-certified materials planted along side.

Sites have been planted (under APFIP supervision) at Hansen Orchards Huon Valley, Tasmania, Rizzato Orchards, Stanthorpe QLD and Brockhoff Orchards, Lenswood South Australia.

APFIP has been evaluating and reporting data from these sites looking at vigour, yield and pack out of both certified and non-certified combinations.

APFIP is continuing to work closely with the Adelaide-based company Netconstructs on improvements to the Certification Database. The database has taken some time to implement as not all nurseries licensed to APFIP conduct traceability in the same way. APFIP's aim has been to deliver flexible tools to their business to help meet the traceability requirements.

APFIP is currently working with its nursery licensees on the smooth introduction of the database into their businesses.

B. Tree Procurement Service (TPS):

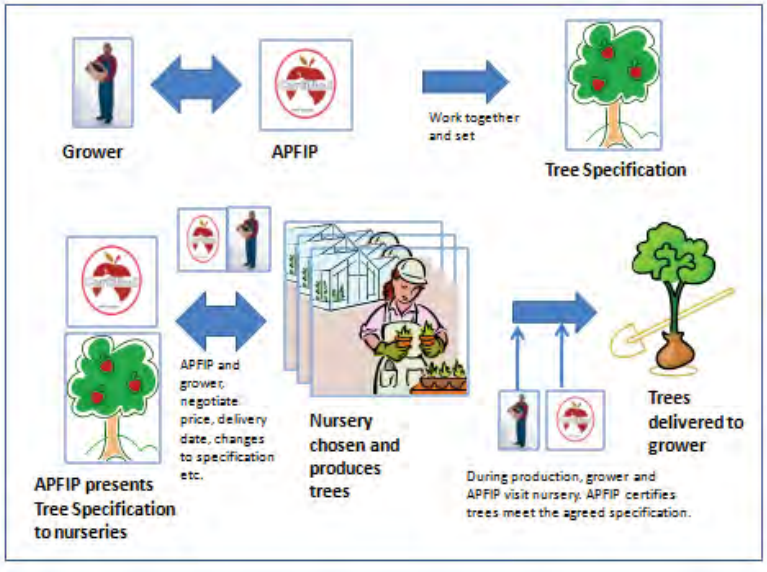
The broad aims of the APFIP Tree Procurement Service (TPS) are:

- To improve growers' awareness of the nursery tree options available to growers (certified/non-certified, rootstocks, tree architecture etc) and to help them specify the tree they want
- Empower growers in their negotiations with nurseries - particularly with respect to setting a detailed specification for the trees they require
- To provide nurseries with a detailed specification of the trees required by a grower
- To ensure growers receive the trees they order
- To improve interactions between growers and nurseries and to be used as a vehicle to promote the value of certification to growers and nurseries.

The service delivers this by

- Liaising with the grower
- Liaising with the nursery
- Promoting a two-way flow of information between the grower and the nursery related to
    - Grower to nursery: the specification
    - Nursery to grower: costs and tree production issues

Figure 3, below, describes, in broad detail, how the TPS will operate



Setting the tree specification:

Using APFIP's current "Nursery Tree Specifications and Tree Types Description" document as a guide, the grower and APFIP work together to set the grower's desired tree specifications. The specifications \ include;

- variety
- rootstock
- scion wood and rootstocks where possible will test negative for the common viruses (e.g. for apples: apple stem pitting virus, apple stem grooving virus, apple mosaic virus, apple chlorotic leafspot virus)
- main roots >250mm after digging
- minimal mechanical damage
- free from lesions, pests (e.g. woolly aphid) and diseases (apple scab, powdery mildew)
- not treated with chemicals to accelerate defoliation other than low biuret urea and copper formulations
- meets phytosanitary requirements of the state where the trees are to be grown
- bundled and transported to ensure minimum damage, roots to remain damp - not to be allowed to dry out.

Tree architecture requirements

- height of bud/graft union above ground
- Trunk caliper at 100mm above the bud/graft union
- Number of branches, height of lowest branch above ground
- Minimum tree height

Appointing a Nursery:
Once the specification is agreed, nurseries that could supply the desired trees to the specification are approached by APFIP. Some nurseries will be immediately eliminated due to the fact that some varieties and rootstocks are proprietary to particular nurseries and therefore will be the only supply option. Conversely some nurseries may chose not be involved with the service.

Once a short list of nurseries had been identified (this may be only one nursery for proprietary varieties/rootstocks) APFIP would then help the grower negotiate the final specification. Frequently there will be compromises between the initial specification requested and what can be delivered.

The grower will negotiate price and time of delivery and enter into a contract with the nursery. Note that APFIP does not contract for the trees. Its role is to help the grower achieve as close to the original specification as possible and to monitor tree development and delivery.

Part of the contract between the grower and the nursery would be that the nursery agrees to allow APFIP to inspect the trees during production and before they are shipped, to make sure that they meet the contracted specification.

Making sure trees delivered meet the agreed specification:
During production APFIP inspect the trees in the nursery. This is be a more general inspection to look for overall uniformity of stocks, any obvious signs of disease or virus in the rootstocks or scion budding/grafting material etc. These visits would also include observation of nutrition and irrigation and any branch initiation treatments. The grower would be encouraged to take part in this inspection to show their interest in the trees to the nursery.

Before the trees leave the nursery, suitably experienced APFIP staff would inspect the trees. Statistically-valid sampling methods would be used. The grower would then be advised of:

- how the actual trees compare to the specification. This would be via a table setting out the details of the specification and the actual details of the trees as measured by APFIP;
- advice as to whether or not the differences between the actual trees and the specification are important or not;
- advice as to whether delivery of the trees should be accepted or not.

(Attachment 9- APFIP nursery Tree Specification)

Roles that APFIP will not take:

APFIP's role is to help the grower set the best possible (achievable) tree specification and to ensure that the delivered trees meet or exceed that specification. It would not:

- Be an agent for the nursery
- Be an agent for the grower
- engage in selling the nursery's left over trees

C. Variety Evaluation:

Currently there are 27 apple varieties and 21 pear varieties undergoing evaluation, in up to 10 evaluation sites Australia wide.

District	Sites	Custodians	Observer's	Weather Station
Batlow NSW	1	1	1	0
Ardmona Vic	1	1	1	1
Orange NSW	1	1	1	1
Applethorpe Qld	2	2	1	1
Manjimup WA	2	2	1	1
Huon Valley Tas	1	1	1EC	1
Tamer Valley Tas	1	1	1	0
Lenswood SA	1	1	1	1
Total	10	10	8	6

There are 34 apple and 17 pear varieties being held in the APFIP repository located in Tasmania. Coordination of evaluation and processing evaluation data from the hundreds of variety x site blocks continues as a major task for the Evaluation Coordinator.

(Attachment 10- Evaluation Active Numbers Register)

Additional activities delivered in this area include:

- Coordinating the delivery of new apple varieties from quarantine to be planted into the APFIP repository;
- Work on identifying new Evaluation Site Custodians who would establish replacement evaluation sites.
- Continued work with variety suppliers (propagating trees and coordinating their delivery) to arrange for the planting into APFIP evaluation sites.

The APFIP Variety Report has been an annual publication. This document;

- Provides an overview of the certification and evaluation services provided by APFIP
- Provides an explanation of the variety reports on the APFIP website and how to read and interpret these reports
- Provides an example of the Weather Summary Report on the APFIP web site and how to interpret these reports
- Reprints an abridged version of the APFIP Annual Report
- Provides evaluation data on varieties that have been in the APFIP variety evaluation program.

D. Quarantine:

APFIP's role is to:

1. Liaise with the Australian Quarantine Inspection Service (AQIS) to:
    a. make sure the industry is adequately protected from exotic diseases, and
    b. that Australia's international competitiveness is not reduced by overly long post entry quarantine periods.
2. Facilitate research into new pathogen testing techniques that may further shorten the post entry quarantine time.

This is achieved by:

Building on the good relationships with AQIS, developing relationships with international quarantine agencies, and reviewing and modifying the virus testing and elimination system.

Provide ongoing access to high security plant quarantine services for importations of new pome fruit varieties and rootstocks into Australia.

APFIP has worked with AQIS to implement a number of improvements to the Post Entry Quarantine protocols, and these will lead to significant benefits to the apple and pears industries.

In the period up to 1998 it took a minimum of 3 to 4 years to introduce a new variety into Australia. A review of the protocols for the importation of bud wood was undertaken in 1998, and the General Manager of APFIP played a key role in urging AQIS to undertake this review. These new protocols were adopted by AQIS in 2002, 4 years later. Two important policies implemented were:

- the ability to have testing completed outside the quarantine station, and
- the ability to implement new tests for the identified exotic diseases once they were verified, without the need for further review of the testing protocols.

The new post entry quarantine protocols are well-established and new varieties and rootstocks now only take 12 months for apples and 18 months for pears to pass through quarantine instead of 4 years under the former protocols. The new protocols utilize viroid and fire blight tests developed under a Hort Innovation project that was partly funded by APFIP.

New protocols have delivered significant benefits to growers and the apple and pear industries by: providing a more secure and rapid post entry quarantine service.

Growers have access to new varieties much earlier, which impacts on their profitability. The industry is able to compete more effectively with overseas competitors as new varieties can be adopted earlier.

There has been more interest from overseas variety owners to consider commercialisation in Australia because constraints on quarantine have been eased.Two future technologies could further improve the

efficiency of post entry quarantine and reduce the time required. Deep Sequencing Genomics is being investigated as a project in the Plant Biosecurity CRC to identify the presence of viruses and viroids in the DNA of trees.

The new Post Entry Quarantine station is now commissioned at Mickleham in Victoria. This station now replaces previous PEQ stations in Victoria, New South Wales and Tasmania. Such changes, within AQIS, are largely beyond the control of APFIP and this project.

E. Weather Stations:

APFIP has been steadily replacing its old dial-up basic weather stations at its evaluation sites, to new MEA stations. These are on line 24/7 and are assessable to all industry via computer or smart phone.

APFIP has always collected basic climatic data from its evaluation sites to complement its evaluation data reports from the evaluation database.

The need to expand the collection of weather data and move to more assessable real time display identified to APFIP that new stations would be of benefits to variety suppliers and industry.

The need for some growers to access climatic data in their growing district as a free service, and to have available specific fruit growing models incorporated other than standard Government weather stations was identified to APFIP as a necessity.

Weather data covering temperature, rainfall, humidity, wind speed, soil temp, chill units, degree days, frost hours, evaporation and apple scab prediction modeling are all accessible.

Data graphing can be accessed free of charge by visiting APFIP.com.au.

F. Website:

APFIP continues to maintain a website, in late 2013 the APFIP website was integrated into the APAL website to gain more exposer and so industry could access information from the one platform.

APFIP maintains a range of information related to certification, evaluation, quarantine and other services it provides. Industry can also access contact detail of certification licensees; program reports etc.

Outcomes

A. Certification Services:

APFIP continues to deliver this program to industry, by means of identifying key nurseries and individual growers to widen the network and capture most of the nursery tree production.

APFIP now has identities licensed to use the nursery tree certification tree tag. These licensees combined would produce approximately 80% of the apple and pear nursery trees produce annually.

Current annual production from these licensees sits at around 450-500,000 certified rootstocks. Current selections are:
Apple
NAKB®37M9
M26
MM111
MM102
Pear
Quince A
Quince C
Quince BA29

APFIP has also been developing and bulking up and distribution of certified budwood material from its certified material repository in Tasmania. This material has also consisted of new and emerging varieties.

Besides the operation of the normal certification service, new developments implemented were:

- the planting of the Certification Demonstration Sites.
- the launch of the APFIP Tree procurement service.
- continued development and integration of the certification database.

(Attachment 11- 2015 Certification Trial Site Report)

B. Tree Procurement Service (TPS):

APFIP's tree procurement service continues to develop well. During this project the evaluation coordinator has developed relationships with a large number of growers seeking advice and guidance in negotiating with nurseries. Growers seeking advice on varieties, rootstocks and orchard development issues have all been a major part of this service. Sourcing and distribution of bud and graft wood to growers has seen APFIP having input into sourcing and delivery of approximately 80-100,000 nursery trees.

C. Variety Evaluation:

APFIP continued to operate eight evaluation sites across all fruit-growing areas in Australia. APFIP is currently evaluating 27 apple and 21 pear cultivars.

Data has been collected annually on flowering, harvest, post-harvest and post-storage. Contracted data collectors are used in all sites except Huon Valley Tasmania where the evaluation coordinator completes this role.

Continued liaison with Australian and international breeding programs and private growers has seen a steady flow of varieties into the evaluation system.

During the project there has been 22 apple varieties and 14 pear varieties started evaluation.

Additional activities delivered in this area include:

- Coordinating the delivery of new apple varieties from quarantine to be planted into the APFIP repository;
- Work on identifying new Evaluation Site Custodians who would establish replacement evaluation sites.

The APFIP Variety Report has been constructed and published in the last half of each year. This document has provided industry with the below updates:

- Provides an overview of the certification and evaluation services provided by APFIP
- Provides an explanation of the variety reports on the APFIP website and how to read and interpret these reports
- Provides an example of the Weather Summary Report on the APFIP web site and how to interpret these reports
- Reprints an abridged version of the APFIP Annual Report
- Provides evaluation data on varieties that have been in the APFIP variety evaluation program.

Links to this document on the APFIP website were published in Australian Fruit Grower and Industry Juice.
Variety showcases were apart of Industry annual conferences. Liaising with growers and creating an opportunity for them to view new and emerging varieties, as well identify the key contacts to explore opportunities was a key outcome of this type of event.

Development of an industry variety sheet was also completed; this allows growers to access info on varieties that are commercialized as well what varieties are in pre-commercialization. Key contact information and variety development as well fruit types were included.

(Attachment 12- APFIP Presentation Industry Conference)

D. Quarantine:

APFIP has continued to be involved on the Post Entry Plant Industries Consultative Committee (PEPICC) of AQIS. This role is undertaken by the Evaluation Coordinator. The PEPICC advises AQIS on quarantine matters, so this is an important role to maintain contact with and influence AQIS on issues that affect pome fruit imports.

PEPICC meets every six months and key outcomes during the life of the project have been direct involvement in:

- Development and commissioning of the PEQ plants facility at Mickleham,
- Review, development and implementation of the PEQ cost recovery policy,
- Reduction of PEQ time for apple and pears, and
- Redevelopment of the import permit application process and database.

APFIP has delivered 13 apple varieties, 2 pear varieties and 1 pear rootstock from post entry quarantine into the APFIP evaluation system during the life of the project.

E. Weather Stations:

During the life of the project APFIP implemented its station upgrade with stations in the Huon Valley Tasmania, Orange New South Wales and Manjimup Western Australia being the first 3 upgrades in 2013. Due to budgeting requirements APFIP then upgraded 1 more in 2014 at Lenswood South Australia, a further 2 were installed at Ardmona Victoria and Stanthorpe Queensland late 2015. APFIP is planning to upgrade 3 more stations in Batlow New South Wales, Tamer Valley Tasmania and Perth Hills Western Australia as part of a continued project.

Due to the station upgrades, industry now has access to weather data covering temperature, rainfall, humidity, wind speed, soil temp, chill units, degree days, frost hours, evaporation and apple scab prediction modeling.

Growers also can use a data calculator on the stations home page to access data totals and averages over a selected date range.

Evaluation and Discussion

Source: *Australian Pome Fruit Improvement Program Ltd Independent Review, Dr Bryan Whan, May 2014*

The most significant, big-picture, achievements of APFIP have been the impacts on quarantine, variety evaluation and the certification of propagating material.

A. Certification

A certification system for rootstock and trees has been implemented to enable growers to access new propagating material that is free of the important viruses, is true to type, and meets prescribed standards. Virus-free parent material has been generated, and a certification process implemented through licensed nurseries.

All the processes and material for an industry wide certification scheme are available, and the scheme has reached a reasonable level of adoption.

Three aspects would need to be continued to ensure the scheme is fully implemented and the industry gains the benefits of the efforts from the last 20 years.

- The generation of certifiable propagating material on an on-going basis in the future.
- Demonstrating the benefits of using certified material to the overall industry, and generating a demand from growers that will force all nurseries to provide certified trees and rootstocks.
- Monitoring and controlling the program to ensure all standards are maintained.

B. Variety evaluation

Variety observation trials have been set up in each of the major production areas in Australia to assess potential new varieties from breeding programs in Australia and overseas. The major benefit of these trials has been to prevent growers planting new varieties that do not have potential in their region.

The variety evaluation trials have largely benefited the breeding programs and variety owners, particularly in a period when some breeding was still being conducted in Departments of Agriculture. Growers have not obtained direct benefits to assist in their choice of varieties, because the trials involve only a few trees of a large number of potential varieties. The trials are also conducted under strict confidentiality where access and information is limited. In an environment where it's likely that all future breeding will be conducted by commercial companies, evaluation of breeding lines should become the responsibility of the breeding programs, rather than a scheme funded by grower levies.

It would be appropriate to use levy funds to establish demonstration trials of a small number of varieties and potential varieties for the direct benefit of growers.

C. Quarantine

New quarantine protocols and technologies have been introduced that have reduced the time required in quarantine for imported apples and pears from 18 months to 12 months during the life of this project.

The original APFIP objective has been accomplished, that was to improve the time it took to import new varieties of apples and pears whilst maintaining or reducing the risk of the introduction of an exotic pest of disease on the plant material. A monitoring role only is required into the future.

Future

After 20 years of operation, it is time for the future of APFIP to be re-assessed, strategically. While some work remains, a number of the major objectives have been achieved and the future role should focus more on ensuring the initiatives are adopted industry wide. APFIP will also be operating in a different commercial environment than in the first 20 years, as breeding is now being conducted by commercial breeding companies, varieties are being accessed globally, and marketing is integrally linked to the variety development. Some major players have considerable influence on the varieties and propagating material available to growers.

Some aspects of the future APFIP, such as the management of the certification system, may be able to be self-funded from commercial income derived from those activities, but other activities such as variety demonstration blocks for growers, may require support from a continued grower levy. It is unlikely that APFIP could generate adequate income from commercial activities to fund all future activities, and it could be argued that it is more relevant to use grower levies to fund initiatives that are for the direct benefit of growers.

Recommendations

The recommendations of the review conducted by Dr Bryan Whan were accepted by APFIP.

Source: *Australian Pome Fruit Improvement Program Ltd Independent Review, Dr Bryan Whan, May 2014*

Quarantine

1. APFIP activities on quarantine should be downgraded to a monitoring and liaison role through membership on the Post Entry Plant Industries Consultative Committee (PEPPIC). Future funding for this activity could be restricted to a small percentage of time for APFIP staff to be involved in the PEPPIC. In the event that an additional effort is required in the future to implement a special initiative, APFIP should seek additional funds from HAL for the specific task.

Evaluation

2. The national evaluation program involving large numbers of potential varieties in observation trials should be phased out as a public good operation by the end of the current project in 2016. In the future, all the breeding and evaluation should be undertaken by commercial companies, and evaluation of new breeding material should be the responsibility of these companies. Provision needs to be made for continuing existing trials until their contracts expire.

3. One evaluation site in the most important apple and pear growing region, the Goulbourn Valley in Victoria, should be maintained to evaluate promising material imported from overseas. This site, funded by grower levies, should be continued until there is confidence in the industry that the Australian breeding and commercialisation companies are accessing all the relevant material from overseas, and making it available to Australian growers. Once the breeding and commercialisation companies are undertaking this role satisfactorily, this site could also be phased out.

4. The observation trials should be replaced with demonstration blocks involving a few varieties that have been released or are near release. These blocks should involve a relatively large number of tress for each variety, around 25 to 50, that can be managed on a commercial basis. These demonstration blocks should be designed to encourage growers to personally inspect and assess the performance of new varieties so they can be sure of their performance before making decisions on new varieties to be adopted. These demonstration blocks should be the focus of field days and promotion. IP issues should be managed through appropriate confidentiality agreements for people

visiting the sites. These demonstration blocks should be funded through the grower levies, on the basis of the benefits it provides to growers.

Certification

5. The certification component of APFIP should continue, to ensure the scheme is fully implemented and the benefits have been fully realised by growers. The whole effort could be lost if pressures to implement a whole of industry certification scheme are eased.

6. The following activities are recommended for the future to ensure the scheme is fully implemented industry wide.

   6.1. APFIP management should provide an ongoing role of monitoring and policing the certification system, until the process is broadly adopted by the nursery and orchard industries.

   6.2. Ensure adequate rootstock and trees are available to fully satisfy the demand for material for nurseries and growers. The perceived limitation of certified material not being available for all stock needs to be removed. If necessary, additional resources should be channeled into this activity immediately to ensure it can be achieved, as this criticism needs to be overcome.

   6.3. An active communication program needs to be implemented to demonstrate and communicate the benefits of the scheme to growers and the nursery industry. A major part of this communication program should be to create an environment where the recalcitrant nurseries are forced into offering high quality virus free material through demand from the growers. APFIP should develop a targeted communication program involving demonstration blocks, field days, publications, grower groups etc. The APFIP and APAL Boards should assist in this process.

   6.4. The role of APFIP in assisting growers to access high quality trees of new varieties should continue, to assist in the broad adoption.

   6.5. Certifiable material of new rootstocks and varieties needs to be produced, when they are released.

   6.6. APFIP needs to work with the nurseries to ensure the process for tagging certified trees is acceptable to the nurseries, to ensure the greatest adoption of the system.

   6.7. The certification system for pear rootstocks and trees needs to be fully developed and implemented.

7. The funding for the future certification component should be paid, where possible, from commercial income from the supply of certified propagating material. However, progress in achieving industry-wide adoption should not be constrained through lack of funding, and the likelihood of some levy funds being required to supplement the commercial funding in the short term needs to be considered and budgeted.

Support for new varieties and breeding programs

8. APFIP should not invest resources in trying to generate collaborations between commercial breeding companies in the future. Collaborations between breeding companies will be driven by business decisions in the future commercial environment.

Pears

9. Any future APFIP activities should include apples and pears, in the one project.

Commercialisation

10. The feasibility of establishing a business to operate a commercial evaluation trial network for breeding programs and variety owners should be assessed. Although it is recommended above that the current observation trials be phased out as a 'public good' operation, APFIP could establish a viable business to provide a commercial evaluation service for breeding programs and variety owners, on a profitable, commercial basis. The trial to evaluate international material, proposed in recommendation 3, and the operation of existing trials until their contracts expire could be undertaken by this business. In the future environment where all breeding will be conducted commercially, there will be a demand for variety evaluation across Australia, and it remains to be seen whether it will be more efficient for breeding programs to conduct these trials in-house or contract another business. An important consideration in assessing the feasibility of establishing an APFIP evaluation business would be whether this is consistent with the roles of the peak industry body and whether it should compete with the commercial sector if there is no market failure.

11. The feasibility of operating the certification business for apples and pears as a full commercial operation should be assessed and budgeted over the next 5 years. The reliance on HAL funds in the short and long terms should be quantified.

12. The reliance on HAL funds should be greatly reduced at the completion of the current project, as some components are terminated and commercial income increases. However, it is likely that some HAL funding should be maintained to ensure the overall objectives are finally achieved, and the benefits communicated. Further allocations of HAL funding should be based on the overall financial position of the APFIP company, and future HAL projects should be seamlessly integrated into the overall company objectives and budget.

Management

13. The reporting process needs to be improved, so the plans and progress are clear.
    - The distinction between the activities of the company and the HAL project need to be reported clearly. The option of preparing one overall report for both that clearly outlines the different activities should be considered.
    - Progress reports need to be more substantial to outline progress towards achieving the overall, long-term objectives as well as the short-term milestones.
    - Progress reports should contain adequate information to convey the progress achieved without the reader having to undertake considerable background research.

14. The human resources skills required for the short and long term futures of the project needs to be assessed, given that there will be a change from mainly technical issues to more communications and promotion.

Planning for the future

15. The APFIP Board and HAL managers should undertake a strategic planning process to define the vision for APFIP post 2016. This should be a strategic, not operational, exercise, and address the following issues:

    - The major industry limitations for the future.
    - The roles of the different industry sectors, and which ones are leading and which ones are constraining progress.
    - The original objectives that have been completed.
    - Aspects that require further work, and the processes required to change industry attitudes and achieve a greater understanding and adoption of the APFIP initiatives.
    - The feasibility of operating evaluation and certification activities as commercial businesses, and the extent to which HAL funds and grower levies may need to supplement funding to ensure the businesses are viable.
    - Map out the key principles for future operations that will form the basis of a new 5 year business plan for APFIP.

Acknowledgements

Bryan Whan Consulting

APFIP Regional Evaluation Site Custodians

APFIP Regional Variety Data Observers

Variety Owners/Licensees

Apple and Pear Australia Ltd (APAL)

Netconstructs IT

Appendices:

1- Certification Rules and Licence.
2- APFIP Evaluation Deed.
3- APFIP Evaluation DL.
4- APFIP Custodian Agreement.
5- Evaluation Observer’s Manual.
6- 2016 Variety Evaluation Report.
7- APFIP Tree Procurement Service DL.
8- APFIP Certification DL.
9- Nursery Tree Specification.
10- Variety Active Numbers Register.
11- Certification Demonstration Site Report.
12- APFIP Speed Updating Presentation.
13- APFIP Business Plan 2010- 2015.
14- 2015 APFIP Review Report.

1- Certification Rules and Licence.

Rules Governing the Use of a Certification Trade Mark

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Recitals

A. Two of APFIP's key objects are to:

(i) develop and promote independent evaluation of pome fruit propagation material for the Australian pome fruit industry; and

(ii) develop and promote standards for pome fruit propagation material that will assist the international competitiveness of the Australian pome fruit industry.

B. The Trade Mark is to be used by APFIP and Approved Users to indicate that, amongst other matters, Trees and Rootstocks bearing Certification Tags have been assessed by APFIP as being Trees and Rootstocks which:

(i) are True to Type;

(ii) have been grown and maintained in specified and controlled conditions;

(iii) have been tested as negative for the Viruses;

(iv) are able to be traced back to its Nuclear Stock Tree; and

(v) have tested negative for the Pests and Diseases;

and, consequently, are more likely to result in increased orchard productivity than Trees and Rootstocks not so certified.

C. The use of the Trade Mark is governed by these Rules.

Rules

1. Definitions and Interpretation

1.1 Definitions

In these Rules:

"**Act**" means the *Trade Marks Act 1995 (Cth)*;

"**APFIP**" means the Australian Pome Fruit Improvement Program Limited ACN 077 345 174;

"**Approved User**" means a nursery or other similar organisation involved in propagating varieties and Rootstocks of *Malus, Pyrus* or *Cydonia* and which satisfies APFIP that, pursuant to clause 6, it meets the Approved User Requirements;

"**Approved User Requirements**" means the requirements set out in Schedule 5;

"**Bundle**" means a bundle of 50 Certified Vegetatively Propagated Rootstocks or Certified Seedling Rootstocks;

"**Business Day**" means a day on which banks are open for business in Melbourne, Victoria;

"**Certification Tag**" means a tag issued by APFIP in the form as APFIP shall determine from time to time and which bears the Trade Mark;

"**Certified**" means;

(a) (subject to clause 5) in respect of Trees, Trees which have been produced in accordance with Schedule 2;

(b) in respect of Vegetatively Propagated Rootstocks, Vegetatively Propagated Rootstocks which have been produced in accordance with Schedule 3;

(c) in respect of Seedling Rootstocks, Seedling Rootstocks which have been produced in accordance with Schedule 4; and

(d) in respect of Rootstocks, both Certified Seedling Rootstocks and Certified Vegetatively Propagated Rootstocks;

"**Financial Statement**" means a statement of financial position and a statement of financial performance;

"**Integrated Orchard Management System**" means an orchard management system which includes details of the use of chemicals for pest and disease control, the source of all planting materials and planting plans, harvest, grading, delivery and quality control records;

"**Licence**" means a non-exclusive licence granted by APFIP to an Approved User to use the Trade Mark on Certification Tags and on substantially similar terms and conditions as set out in Annexure "A";

"**Nuclear Stock Trees**" means Trees which have been produced and maintained in accordance with item 2.2 of Schedule 2;

"**PBR Descriptions**" means plant variety descriptions as recorded from time to time on the register maintained by the Department of Agriculture, Fisheries and Forestry Australia;

"**Pests and Diseases**" means the following pests and diseases:

(a) apple and pear scab (*Venturia inequalis, Venturia nashicola*);

(b) powdery mildew (*Podosphaeria leucotricha*);

(c) woolly apple aphid *(Eriosoma lanigerum*); and

(d) such other pests and diseases specified in writing by APFIP from time to time;

"**Phytosanitary Regulations**" means the laws relating to Australian import regulations and post entry quarantine protocols as are in place from time to time;

"**Propagation Stock Tees**" means Trees which have been produced and maintained in accordance with item 2.3 of Schedule 2;

"**Rootstock**" means a plant of the species *Malus*, *Pyrus* or *Cydonia* onto which Scion/Budwood is grafted or budded and includes both Vegetatively Propagated Rootstocks and Seedling Rootstocks;

"**Scion/Budwood**" means, in relation to plant varieties of the species *Malus*, *Pyrus* or *Cydonia*, any part or product from which, whether alone or in combination with other parts or products of that plant, another plant with the same essential characteristics of the variety can be produced;

"**Seedling Rootstocks**" means Rootstocks which are introduced, maintained, produced and sold in accordance with Schedule 4;

"**Trade Mark**" means the certification trade mark which is the subject of Australian trade mark application number 964237;

"**Tree**" means a tree which is produced from successfully grafting or budding Scion/Budwood onto Rootstock;

"**True to Type**" means a method used by APFIP to determine whether one generation of Tree or Rootstock is substantially similar the previous generation of that Tree or Rootstock as set out in Schedule 6;

"**Vegetatively Propagated Rootstock**" means rootstock which has been multiplied by an asexual process and are introduced, maintained, propagated and sold in accordance with Schedule 3; and

"**Virus**" means one of either *apple chlorotic leaf spot trichovirus*, *apple mosaic ilarvirus*, *apple stem-grooving capillovirus* or *apple stem pitting foveavirus*.

1.2 **Interpretation**

In these Rules:

(a) headings are inserted for convenience only and do not affect the interpretation of these Rules; and

unless the context otherwise requires:

(b) words importing the singular include the plural and vice versa;

(c) a word importing a gender includes the other gender;

(d) a reference to a person includes an individual, a partnership, a body corporate, a joint venture, an association (whether incorporated or not), a government and a government authority or agency;

(e) a reference to a clause is a reference to a clause of these Rules;

(f) a reference to these Rules includes the recitals and any schedules, annexures, exhibits or attachments to these Rules;

(g) a reference to legislation includes any statutory modification or replacement and any subordinate or delegated legislation issued under such legislation;

(h) if the day on which anything is to be done is not a Business Day it shall be done on the next Business Day; and

(i) a reference to "$" or dollars means Australian dollars and a reference to payment means payment in Australian dollars.

2. Property in the Trade Mark

The Trade Mark is the absolute property of APFIP and shall not be used by any person other than with the express written authority of APFIP.

3. Use of the Trade Mark

3.1 Only APFIP or Approved Users may use the Trade Mark.

3.2 APFIP may use the Trade Mark in accordance with these Rules.

3.3 Pursuant to clause 6, a person may apply to become an Approved User and may be authorised by the grant of a Licence by APFIP to use the Trade Mark in accordance with these Rules and the Licence.

3.4 The Trade Mark shall only be used by Approved Users on Certification Tags and in association with Certified Trees or Certified Rootstocks.

3.5 Subject to clause 3.6, Approved Users shall only use Certification Tags which are purchased from APFIP:

(a) in respect of Certified Trees, on a one Certification Tag per Certified Tree basis; or

(b) in respect of Certified Rootstocks, on a one Certification Tag per Bundle basis.

3.6 An Approved User shall only use a Certification Tag in association with the particular Tree or Bundle in respect of which the Certification Tag was issued.

3.7 A request to purchase a Certification Tag shall be accompanied by a signed declaration in a form prescribed by APFIP from time to time detailing the Approved

User's right to produce, reproduce, propagate and sell the Certified Trees or Rootstocks.

3.8 A Certification Tag shall only be issued by APFIP to an Approved User if APFIP, at its sole and unfettered discretion, is satisfied that the Approved User is not in breach of the *Plant Breeder's Rights Act* (Cth) 1994.

3.9 Where a Certified Tree or Certified Rootstock has been propagated by an Approved User, the Trade Mark shall, at all times, be accompanied by a statement that Certified Trees and Certified Rootstocks have been propagated by that Approved User.

3.10 An Approved User must ensure that a Certification Tag is applied to:

(a) each Tree sold or promoted by the Approved User which meets the requirements for Certified Trees under these Rules including (without limitation) the requirements set out in Schedule 2 and Schedule 7; and

(b) each Bundle of Rootstock sold or promoted by the Approved User which meets the requirements for Certified Rootstock under these Rules including (without limitation) the requirements set out in Schedules 3, 4 and 8.

3.11 An Approved User must not sell Rootstock in quantities of less than one Bundle, unless it obtains APFIP's prior written consent to the sale.

3.12 Section 26 of the Act does not apply.

4. Production of Certified Trees and Certified Rootstocks

4.1 Subject to clause 5, Certified Trees shall only be produced and sold by APFIP and/or an Approved User in accordance with Schedule 2.

4.2 Certified Vegetatively Propagated Rootstocks shall only be produced and sold by APFIP and/or an Approved User in accordance with Schedule 3.

4.3 Certified Seedling Rootstocks shall only be produced and sold by APFIP and/or an Approved User in accordance with Schedule 4

4.4 For clarification purposes, the relationship between Schedules 2, 3 and 4 has been visually represented in Schedule 1.

5. Production otherwise than in accordance with Schedule 2

5.1 If an Approved User wishes to produce or sell Certified Trees otherwise than as prescribed by items 2.4.1 or 2.5 of Schedule 2, the Approved User shall:

(a) notify APFIP as to how it intends to produce or sell Certified Trees differently as prescribed by items 2.4.1 or 2.5 of Schedule 2; and

(b) request APFIP's written consent that it is authorised to produce or sell Certified Trees in the manner that it intends as set out in clause 5.1(a).

5.2 APFIP may, at its sole and unfettered discretion and subject to any conditions that it sees fit, consent to the Approved User producing or selling Certified Trees in the manner set out in clause 5.1(a).

5.3 The Approved User shall only produce or sell Certified Trees otherwise than as prescribed by items 2.4.1 or 2.5 of Schedule 2 if APFIP has given its written consent to do so in accordance with clause 5.2.

6. Application for Approved User status

6.1 An application to APFIP for Approved User status shall be made in writing and be addressed to:

C/- The General Manager
Australian Pome Fruit Improvement Program Limited
35 Turn Creek Road
Grove Tasmania 7109

6.2 An application made pursuant to clause 6.1 shall include:

(a) written material giving information about the applicant and evidence that the applicant meets the Approved User Requirements, including a complete set of Financial Statements (in a form reasonably agreed to by APFIP) relating to the applicant as at the preceding 30 June or 31 December (whichever is the later); and

(b) written references from at least three industry/business referees (who, in APFIPs opinion, are of good standing in the community) which substantiate that the applicant meets the Approved User Requirements.

6.3 Where APFIP requires more information or evidence in relation to the application provided pursuant to clause 6.2, the applicant shall provide the required information or evidence to APFIP.

6.4 As soon as practicable, APFIP shall confirm receipt of the application and arrange, at a mutually convenient time, for an inspection by APFIP or its authorised representatives of the premises on which the Trees and Rootstocks are to be selected, maintained, propagated and sold for the purpose of APFIP determining whether the applicant meets the Approved User Requirements.

6.5 As soon as practicable, APFIP shall notify the applicant in writing whether APFIP is satisfied that the applicant meets the Approved User Requirements.

6.6 If APFIP is satisfied that the applicant meets the Approved User Requirements:

(a) APFIP shall grant a Licence to the applicant;

(b) the applicant shall be deemed to be an Approved User; and

(c) the Approved User may use the Trade Mark in accordance with the Licence and be eligible to purchase Certification Tags from APFIP in accordance with clause 3.

6.7 If APFIP is not satisfied that the applicant meets Approved User Requirements, APFIP shall notify the applicant of the reasons why it is not so satisfied.

6.8 An unsuccessful applicant for Approved User status may make another application pursuant to this clause.

6.9 A Licence will normally be granted for five years, but a licence for a period other than five years may be granted by APFIP at its sole and unfettered discretion.

6.10 APFIP shall use its reasonable endeavours to keep any confidential information that it receives pursuant to this clause confidential.

7. Record keeping

7.1 An Approved User is required to keep records in accordance with Schedule 13.

7.2 The records kept by an Approved User in accordance with Schedule 13 shall be provided to APFIP by no later 30 July of each year during the term of the Licence.

8. Monitoring and auditing the use of the Trade Mark

8.1 Upon giving reasonable notice to an Approved User, APFIP or its representatives may, from time to time and during the term of the Licence, conduct random inspections to ensure that an Approved User is using the Trade Mark exclusively in association with Certified Trees and Certified Rootstocks and in accordance with the Licence.

8.2 If APFIP is not satisfied that the Trade Mark is being used exclusively in association with Certified Trees, Certified Rootstocks and/or in accordance with the Licence (as the case may be), APFIP shall notify the Approved User of the result of its inspection and the Approved User shall, within 14 days of such notification, ensure, to the satisfaction of APFIP, that the Trade Mark is being used exclusively in association with Certified Trees and/or Certified Rootstocks or in accordance with the Licence (as the case may be).

8.3 Where APFIP is still not satisfied that the Trade Mark is being used exclusively in association with Certified Trees and/or Certified Rootstocks and/or in accordance with the Licence (as the case may be), the Licence may be terminated by APFIP at any time by APFIP giving written notice to that effect to the Approved User and the Approved User shall cease being an Approved User.

9. Termination or expiry of Licence

Upon termination or expiry of a Licence, the former licensee shall:

(a) cease to use the Trade Mark in any way (including, but not limited to, ceasing to distribute or sell Trees and/or Rootstocks with Certification Tags); and

(b) either destroy or return to APFIP all relevant packaging bearing the Trade Mark, including, but not limited to, all Certification Tags which have previously been issued.

10. Amendment of the Rules

Subject to the Act, APFIP may alter these Rules at any time and at its absolute discretion.

11. Dispute resolution

Where there is a dispute between the parties arising:

(a) from a refusal by APFIP to certify Rootstocks or Trees;

(b) from a refusal by APFIP to allow the use of the Trade Mark; or

(c) from the construction, termination or breach of these Rules;

then such dispute shall, unless resolved within 21 days from the date on which notice of the dispute is given by a party, be referred for mediation in accordance with the *Mediation and Conciliation Rules* for the time being of the Institute of Arbitrators & Mediators of Australia at the request of any party to the dispute, to:

(a) a mediator agreed on by the parties to the dispute; or

(b) if the parties to the dispute are unable to agree on a mediator within seven days of the expiry of such notice, a mediator appointed by the then current President of the Law Institute of Victoria or a person of an equivalent position at an equivalent organisation of another State as determined by APFIP in its sole and unfettered discretion;

provided that the mediation is commenced within seven days of the referral or such later time as agreed by the parties to the dispute.

12. Warranty and certification

12.1 APFIP warrants that, to the best of its knowledge and belief, Certified Trees and/or Certified Rootstocks are more likely to result in increased orchard productivity than trees and Rootstocks not so certified.

12.2 APFIP warrants that it will use its reasonable endeavours to ensure that Trees and Rootstocks which are tested and treated for the Viruses in accordance with these Rules are tested and treated by what APFIP considers to be the latest virus testing and treatment procedures and processes available at that time.

12.3 The Trade Mark does not certify and APFIP does not warrant that:

(a) Certified Trees and/or Certified Rootstocks:

(i) are free of the Viruses or any other viruses; and

(ii) are free of the Pests and Diseases or any other pests and diseases; and

(b) use of any trees, Rootstocks and/or Scion/Budwood is in any way compliant with or authorised under any law including, but not limited, to the *Plant Breeder's Rights Act* (Cth) 1994 or the Phytosanitary Regulations.

12.4 APFIP shall, to the maximum extent permitted by law, not be liable to the Approved User or any other party for any damage, loss or injury caused as a result of the use of any product (including but not limited to Trees and Rootstocks).

13. Jurisdiction

These Rules shall be governed by and construed in accordance with the laws of Victoria and the parties hereby submit to the exclusive jurisdiction of Victorian courts and any courts which have jurisdiction to hear appeals from any of those courts.

14. Severability

If any provision of these Rules is invalid or not enforceable in accordance with its terms in any jurisdiction, it is to be read down for the purposes of that jurisdiction, if possible, so as to be valid and enforceable and shall otherwise be capable of being severed to the extent of the invalidity or unenforceability without affecting the remaining provisions of these Rules or affecting the validity or enforceability of that provision in any other jurisdiction.

15. Further Assurances

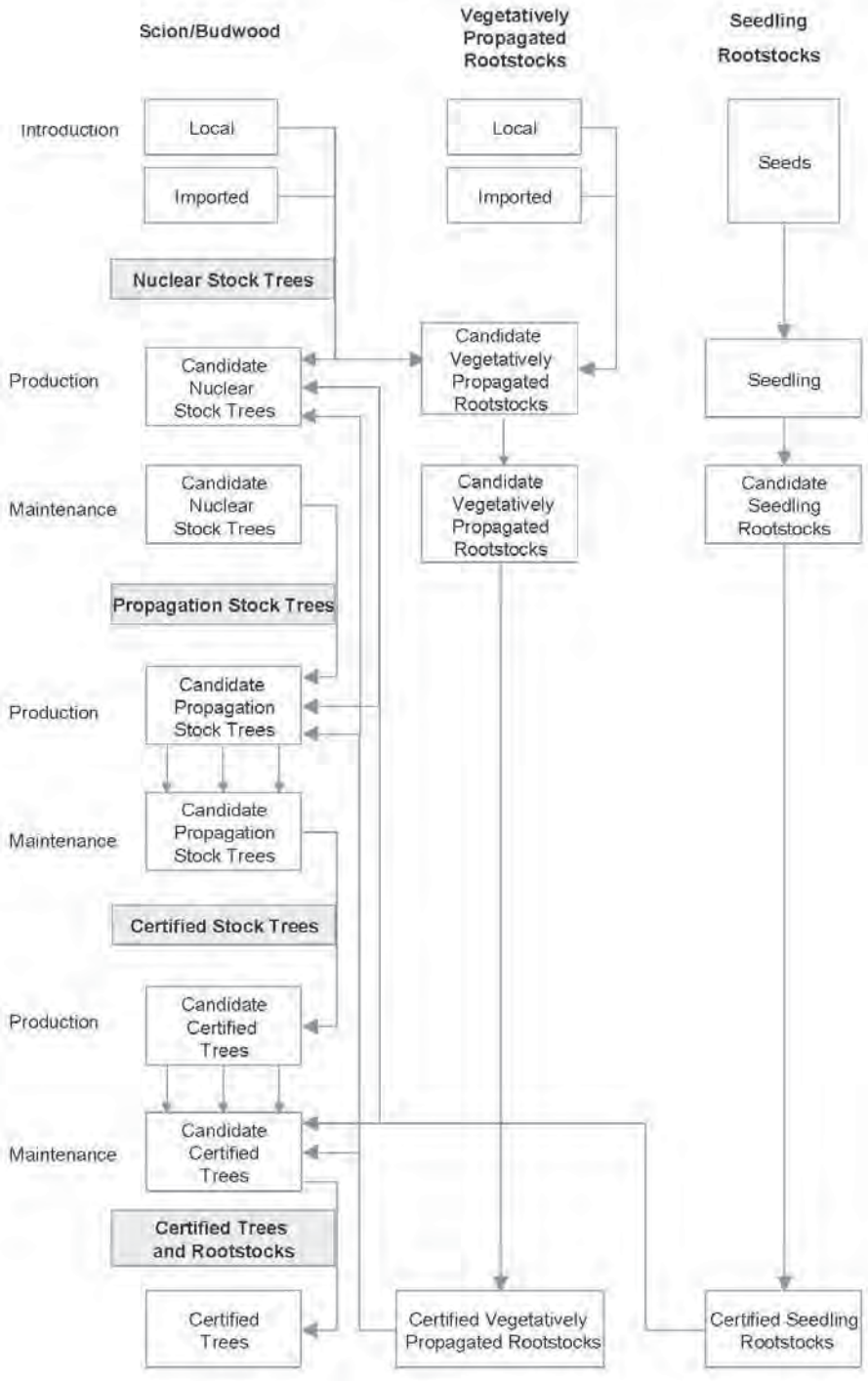
The Approved User shall sign, execute, deliver and do and shall procure that each of its officers, employees and agents signs, executes, delivers and does, all deeds, documents, instruments and acts reasonably required of it or them by notice from another party to effectively carry out and comply with these Rules and the rights and obligations of the parties under it.

16. Costs

16.1 APFIP and the Approved User shall pay their own costs and expenses in respect of the any negotiation, preparation, execution, delivery and stamping of any documents and for any service or obligation contemplated by these Rules.

16.2 In particular, and without limiting the generality of clause 16.1, the Approved User shall be responsible for all costs and expenses associated in any way with testing and treatment of the Viruses or the Pests and Diseases.

SCHEDULE 1


Scion/Budwood
Vegetatively Propagated Rootstocks
Seedling Rootstocks
Introduction
Local
Imported
Local
Imported
Seeds
Nuclear Stock Trees
Production
Candidate Nuclear Stock Trees
Candidate Vegetatively Propagated Rootstocks
Seedling
Maintenance
Candidate Nuclear Stock Trees
Candidate Vegetatively Propagated Rootstocks
Candidate Seedling Rootstocks
Propagation Stock Trees
Production
Candidate Propagation Stock Trees
Maintenance
Candidate Propagation Stock Trees
Certified Stock Trees
Production
Candidate Certified Trees
Maintenance
Candidate Certified Trees
Certified Trees and Rootstocks
Certified Trees
Certified Vegetatively Propagated Rootstocks
Certified Seedling Rootstocks

SCHEDULE 2

Introduction, Maintenance, Production and Selling of Certified Trees

This schedule sets out the steps and procedures necessary to produce and sell Certified Trees.

2.1 Introduction of Scion/Budwood

Only Scion/Budwood which is sourced in accordance with items 2.1.1 or 2.1.2 shall be used to produce candidate Nuclear Stock Trees in accordance with item 2.2.1.

2.1.1 Scion/Budwood sourced from local trees

Scion/Budwood may be sourced directly from a fruiting tree which has been grown in Australia and which:

(a) has been selected from an orchard and/or from pomological field trials within Australia;

(b) has tested as negative for each of the Viruses in accordance with Schedule 10;

(c) has been assessed by APFIP as being True to Type; and

where candidate Nuclear Stock Trees are to be produced by an Approved User, that Approved User has sent to APFIP details of:

(i) the geographic location of the original tree; and

(ii) the Approved User's right to use, produce, reproduce, propagate, sell and import the Scion/Budwood.

2.1.2 Importation of Scion/Budwood sourced from imported foreign trees

Scion/Budwood may be sourced from a tree which has been imported into Australia and which:

(a) has met the Phytosanitary Regulations;

(b) has been tested as negative for each of the Viruses in accordance with Schedule 10;

(c) has been assessed by APFIP as being True to Type; and

where candidate Nuclear Stock Trees are to be produced by an Approved User, that Approved User has sent to APFIP details of:

(i) the geographic location of the imported tree; and

(ii) the Approved User's right to produce, reproduce, propagate, sell and import the Scion/Budwood.

2.2 **Production of Nuclear Stock Trees**

Only candidate Nuclear Stock Trees which are produced in accordance with item 2.2.1 and maintained in accordance with item 2.2.3 shall qualify as Nuclear Stock Trees and be used to produce candidate Propagation Stock Trees in accordance with item 2.3.1.

2.2.1 **Production of candidate Nuclear Stock Trees**

(a) Candidate Nuclear Stock Trees shall only be produced by budding or grafting Scion/Budwood which has been introduced in accordance with either item 2.1.1 or item 2.1.2 onto:

(i) Certified Vegetatively Propagated Rootstocks; or

(ii) Certified Seedling Rootstocks.

(b) Candidate Nuclear Stock Trees must:

(i) test negative for each of the Viruses in accordance with Schedule 10; and

(ii) during the period of Virus testing, be grown in and kept under conditions specified in Schedule 11.

(c) If a candidate Nuclear Stock Tree tests positive for any one of the Viruses, the candidate Nuclear Stock Tree may only be promoted to Nuclear Stock Tree status and be maintained in accordance with item 2.3 if the infected candidate Nuclear Stock Tree undergoes Virus treatment in accordance with item 2.2.2.

(d) Notwithstanding the above if, in the opinion of either APFIP or an Approved User, it is possible that all candidate Nuclear Stock Trees are infected with any one of the Viruses, APFIP or the Approved User may omit the testing procedure outlined at item 2.2.1(b) and proceed directly to the treatment procedure outlined at item 2.2.2.

2.2.2 **Treatment of candidate Nuclear Stock Trees**

(a) A candidate Nuclear Stock Tree which tests positive for any one of the Viruses under item 2.2.1(c) is to be Virus treated in accordance with Schedule 9.

(b) A candidate Nuclear Stock Tree which is Virus treated in accordance with Schedule 9 may only be maintained in accordance with item 2.2.3 and

subsequently qualify as a Nuclear Stock Tree if the candidate Nuclear Stock Tree:

(i) has tested negative for each of the Viruses after one full growing season in accordance with Schedule 10; and

(ii) during the period of Virus testing, has been grown in and kept under conditions set out in Schedule 11.

2.2.3 **Maintenance of candidate Nuclear Stock Trees**

A candidate Nuclear Stock Tree may only qualify as a Nuclear Stock Tree and be used to produce candidate Propagation Stock Trees in accordance with item 2.3, if it has been:

(a) inspected for the presence of the Pests and Diseases and, if Pests and Diseases are detected, treated in accordance Schedule 12; and

(b) grown in and kept under the conditions specified in Schedule 11.

2.3 **Production of Propagation Stock Trees**

Only candidate Propagation Stock Trees which are produced in accordance with item 2.3.1 and maintained in accordance with item 2.3.2 shall qualify as Propagation Stock Trees and be used to produce candidate Certified Trees in accordance with item 2.4.1.

2.3.1 **Production of candidate Propagation Stock Trees**

(a) Candidate Propagation Stock Trees may only be produced by budding or grafting Scion/Budwood obtained from Nuclear Stock Trees onto:

(i) Certified Vegetatively Propagated Rootstocks; or

(ii) Certified Seedling Rootstocks.

(b) Nuclear Stock Trees are to be multiplied in as few steps as possible to obtain the required quantity of candidate Propagation Stock Trees.

(c) The volume of Scion/Budwood to be taken from each Nuclear Stock Tree in accordance with item 2.3.1(a) is to be recorded in accordance with item (d) of Schedule 13.

2.3.2 **Maintenance of candidate Propagation Stock Trees**

(a) Subject to items (b), (c), (d) and (e), below, a candidate Propagation Stock Tree may only qualify as a Propagation Stock Tree and be used to produce candidate Certified Trees in accordance with item 2.4.1, if it has:

(i) been grown in and kept under conditions specified by Schedule 11;

(ii) been Virus indexed in accordance with Schedule 14;

(iii) been inspected for the presence of Pests and Diseases and, if Pests and Diseases are detected, treated in accordance with Schedule 12;

(iv) fruited;

(v) been able to be traced back to its Nuclear Stock Tree; and

(vi) been assessed as being True to Type by APFIP in accordance with Schedule 6.

(b) The origin of each candidate Propagation Stock Tree shall be verified, recorded and registered with APFIP in accordance with Schedule 13.

(c) A candidate Propagation Stock Tree which tests positive for a Virus shall not be used to produce Propagation Stock Trees and shall immediately be removed from any lots which contain candidate Propagation Stock Trees

(d) If there is an indication that Virus infection in a candidate Propagation Stock Tree has derived from its parent tree, no candidate Propagation Stock Tree which has been derived from that same parent tree shall be used as a Propagation Stock Tree.

(e) A candidate Propagation Stock Tree which is assessed by APFIP as not being True to Type shall not be used as a Propagation Stock Tree.

2.4 Production of Certified Trees

Only candidate Certified Trees which are produced in accordance with item 2.4.1 and maintained in accordance with item 2.4.2 shall qualify as a Certified Tree and be sold in accordance with item 2.5.

2.4.1 Production of candidate Certified Trees

(a) Candidate Certified Trees shall only be produced by grafting or budding Scion/Budwood obtained from Propagation Stock Trees onto:

(i) Certified Seedling Rootstocks; or

(ii) Certified Vegetatively Propagated Rootstocks.

(b) Budding or grafting of the Scion/Budwood onto the Rootstock should be between 100mm and 200mm from the ground.

2.4.2 **Maintenance of candidate Certified Trees**

A candidate Certified Tree shall only qualify as a Certified Tree and be sold in accordance with item 2.5, if it has:

(a) been grown in and kept under conditions specified by Schedule 11;

(b) been inspected for the presence of the Pests and Diseases and, if Pests or Diseases are detected, treated in accordance with Schedule 12; and

(c) not been treated with any chemicals to accelerate defoliation of leaves other than low biuret urea and copper formulations (hand stripping of leaves can occur, but only on the growing tips).

2.5 **Selling Certified Trees**

Subject to clause 5 of these Rules, a Certified Tree shall not be sold unless the Certified Tree:

(a) meets the minimum Certified Tree requirements as set out in Schedule 7;

(b) has minimal damage from mechanical harvest or other operations;

(c) has a minimum height of 1.6 metres measured from the ground;

(d) has a minimum caliper size (trunk diameter) of 12 mm measured 100mm above the graft/bud union;

(e) has been left with a root system following lifting that can adequately support the tree with, where possible, the main roots are a minimum of 150mm in length;

(f) is free of residual soil;

(g) is bundled and transported in order to:

(i) prevent damage; and

(ii) ensure that tree roots remain damp;

(h) has been treated for Pests and Diseases in accordance with item 12.2 of Schedule 12; and

(i) has no visual symptoms of the Pests and Diseases.

SCHEDULE 3

Introduction, Maintenance, Production and Selling of Certified Vegetatively Propagated Rootstocks

This schedule sets out the steps and procedures necessary to produce and sell Certified Vegetatively Propagated Rootstocks.

3.1 Introduction of Vegetatively Propagated Rootstocks

Only Vegetatively Propagated Rootstocks which have been introduced as candidate Vegetatively Propagated Rootstocks in accordance with item 3.1.1 or item 3.1.2 may be used to produce candidate Certified Vegetatively Propagated Rootstocks in accordance with item 3.3.1.

3.1.1 Candidate Vegetatively Propagated Rootstocks sourced from local trees or production beds

Subject to item 3.2, a candidate Vegetatively Propagated Rootstock which is selected from local rootstock production beds (or, in the case of the species *Cydonia*, trees) may be used to produce candidate Certified Vegetatively Propagated Rootstocks in accordance with item 3.3.1. if it is:

(a) in the opinion of APFIP or an Approved User, from healthy-looking, vigorous and well-rooted individual trees or trees which are grown in production beds or, in the case of the species *Cydonia*, trees;

(b) individually tested as negative for each of the Viruses in accordance with Schedule 10;

(c) assessed by APFIP as being True to Type; and

where the candidate Vegetatively Propagated Rootstock is to be produced by an Approved User, that Approved User must send to APFIP details of:

(i) the geographic location of the original tree; and

(ii) the Approved User's right to produce, reproduce, propagate, sell and import the candidate Vegetatively Propagated Rootstock.

3.1.2 Direct Importation of Candidate Vegetatively Propagated Rootstocks

Subject to item 3.2, a candidate Vegetatively Propagated Rootstock which is selected and imported into Australia may only be used to produce candidate Certified Vegetatively Propagated Rootstocks in accordance with item 3.3.1 if it is:

(a) individually tested as negative for each of the Viruses in accordance with Schedule 10;

(b) assessed by APFIP as being True to Type; and

(c) meets the Phytosanitary Regulations; and

where the candidate Vegetatively Propagated Rootstock is to be produced by an Approved User, the Approved User must send to APFIP details of:

(i) the geographic location of the original tree; and

(ii) the Approved User's right to produce, reproduce, propagate, sell and import the candidate Vegetatively Propagated Rootstock.

3.2 Treatment of candidate Vegetatively Propagated Rootstocks

(a) A candidate Vegetatively Propagated Rootstock which tests positive for any one of the Viruses under item 3.1.1 or item 3.1.2 is to be Virus treated in accordance with Schedule 9.

(b) A candidate Vegetatively Propagated Rootstock which is treated in accordance with Schedule 9 may only be used to produce candidate Certified Vegetatively Propagated Rootstocks in accordance with item 3.3.1 if it:

(i) has tested negative for each of the Viruses after one growing season in accordance with Schedule 10; and

(ii) during the period of Virus testing, has been grown in and kept under conditions set out in Schedule 11.

3.3 Production of Certified Vegetatively Propagated Rootstocks

Only candidate Certified Vegetatively Propagated Rootstocks which are produced in accordance with item 3.3.1 and maintained in accordance with item 3.3.2 shall qualify as Certified Vegetatively Propagated Rootstocks and be sold in accordance with item 3.5.

3.3.1 Production of candidate Certified Vegetatively Propagated Rootstocks

A candidate certified Vegetatively Propagated Rootstock shall only be produced if it has been:

(a) multiplied in as few steps as possible using conventional rootstock production techniques, including stooling, layering, tissue culture and nurse rooting (provided that such rooting is completed by using Certified Rootstocks) to produce candidate Vegetatively Propagated Rootstock production areas;

(b) virus indexed in accordance with Schedule 14;

(c) grown in and kept under conditions specified in Schedule 11; and

(d) A candidate Certified Vegetatively Propagated Rootstock in which a Virus is detected:

(i) shall not be used as a Certified Vegetatively Propagated Rootstock in accordance with item 3.4(a);

(ii) shall be removed from any lots which contain candidate Certified Vegetatively Propagated Rootstocks; and

any other candidate certified Vegetatively Propagated Rootstock which has been grown within a 5 metre radius of the infected Rootstock shall also be removed.

3.3.2 **Maintenance of Vegetatively Propagated Rootstocks**

(a) A candidate Certified Vegetatively Propagated Rootstock shall only qualify as a Certified Vegetatively Propagated Rootstock and be used in accordance with item 3.4, if it has been:

(i) grown in and kept under conditions specified in Schedule 11;

(ii) visually inspected during each growing season for the Viruses; and

(iii) visually inspected for Pests and Diseases and if Pests and Diseases are detected, treated in accordance with Schedule 12.

(b) A candidate Certified Vegetatively Propagated Rootstock in which a Virus is detected:

(i) shall not be used as a Certified Vegetatively Propagated Rootstock in accordance with item 3.4(a);

(ii) shall be removed from any lots which contain candidate Certified Vegetatively Propagated Rootstocks; and

any other candidate certified Vegetatively Propagated Rootstock which has been grown within a 5 metre radius of the infected Rootstock shall also be removed.

3.4 **Use of Certified Vegetatively Propagated Rootstocks**

(a) Certified Vegetatively Propagated Rootstocks may be:

(i) used to produce:

(A) Candidate Nuclear Stock Trees in accordance with item 2.2.1 of Schedule 2;

(B) Candidate Propagation Stock Trees in accordance with item 2.4 of Schedule 2; or

(C) Candidate Certified Trees in accordance with item 2.4.1 of Schedule 2;

(ii) used to produce candidate Certified Vegetatively Propagated Rootstocks in accordance with item 3.3.1; or

(iii) sold as a Certified Vegetatively Propagated Rootstock in accordance with item 3.5.

3.5 Selling Certified Vegetatively Propagated Rootstocks

(a) A Certified Vegetatively Propagated Rootstock shall not be sold by APFIP or an Approved User until it meets the conditions set out in Schedule 8.

(b) Certified Vegetatively Propagated Rootstocks shall be bundled and transported to prevent damage and to ensure that roots remain damp.

SCHEDULE 4

Introduction, Maintenance, and Production of Certified Seedling Rootstocks

This schedule sets out the procedures necessary to produce and sell Certified Seedling Rootstocks.

(a) Only Seedling Rootstocks which meet the criteria set out in items (b) – (g) shall qualify as a Certified Seedling Rootstock.

(b) Seeds of Malus, Pyrus or Cydonia may be introduced by APFIP or an Approved User.

(c) Seeds are to be selected from a known source, and the source recorded.

(d) Seed germination is to occur in fresh soil not previously used for pome fruit propagation.

(e) The Seedling Rootstock must be grown to a suitable size for budding or grafting.

(f) Seedling Rootstocks are to be approved for trueness to type by APFIP in accordance with item 6.2 of Schedule 6.

(g) Any Seedling Rootstocks which are assessed as not being True to Type shall not be eligible to qualify for Certified Seedling Rootstock status.

(h) Certified Seedling Rootstocks may be:

  (A) used to produce:

    (i) candidate Nuclear Stock Trees in accordance with item 2.2.1 of Schedule 2;

    (ii) candidate Propagation Stock Trees in accordance with item 2.3.1 of Schedule 2; or

    (iii) candidate Certified Trees in accordance with item 2.4.1 of Schedule 2; or

  (B) sold as Certified Seedling Rootstock in accordance with items (i) and (j).

(i) A Certified Seedling Rootstock shall not be sold by APFIP or an Approved User until it meets the conditions as set out in Schedule 8.

(j) When sold, Certified Seedling Rootstocks must be bundled and transported to prevent damage and to ensure that the roots remain damp.

SCHEDULE 5

Approved User Requirements

A nursery or other similar organisation must be able to demonstrate, to the satisfaction of APFIP, that it:

(a) has the capacity (including, but not limited to adequate property, premises, plant, personnel, equipment, stock or other facilities), skill and expertise to meet all of the requirements set out in the Rules and, in particular, to select, maintain and produce Certified Trees and Rootstocks;

(b) has at least 10 years experience in the commercial pome fruit nursery industry with particular expertise in nursery tree and rootstock production or, where it does not have at least 10 years experience in the commercial pome fruit nursery industry, have exceptional expertise in nursery tree and rootstock production;

(c) has an Integrated Orchard Management System;

(d) has a demonstrated commitment to ongoing improvement of nursery production systems;

(e) has a commercially sound business plan or business operation;

(f) has a clear and demonstrated vision of the medium to long term that shows a *bona fide* commitment to the Australian pome fruit industry which is consistent with the goals and aspirations of APFIP;

(g) is not in default under a decree, or a by-law or regulation of any government, statutory, municipal body or organisation having jurisdiction over the nursery and is compliant and will continue to be compliant in all material respects with and not in breach of all relevant laws (including, but not limited to, the *Plant Breeder's Rights Act 1994 (Cth)*); and

(h) holds all licences, permits, authorisations, and consents required for the conduct of all aspects of its business, and to the best of its knowledge, all such licences, permits and authorisations as required are in full force and effect.

SCHEDULE 6

Trueness to Type

Trueness to type refers to a method used by APFIP for determining whether one generation of tree or Rootstock is substantially similar to its previous generation.

6.1 Trees

An assessment by APFIP of varietal trueness to type in respect of Trees will be based on the description of fruit from the original Tree.

(a) Where PBR Descriptions are available, PBR Descriptions shall form the basis of the assessment.

(b) Where PBR Descriptions do not exist, the following parameters will be used by APFIP as a reference:

(i) growth habit (upright, spreading, weeping);

(ii) tree vigour (weak, medium, strong, very strong);

(iii) fruiting habit (tip bearing, lateral bearing, semi-spur, spur);

(iv) leaf colour (grey green, green, deep green);

(v) leaf size (small, moderate, large);

(vi) fruit shape (flat, flat-round, round, round-conical, conical, long-conical, round-oblong, square-oblong;

(vii) fruit over colour (none, cream, yellow, green, brown, orange, pink, pinkish-red, red, maroon, purple);

(viii) background colour (cream, yellow, yellow-green, green);

(ix) colour type (solid, blushed, bicoloured);

(x) stripe/streak (not present, partial, prominent);

(xi) lenticels (prominent, not prominent);

(xii) russet (free, partial, heavy, complete);

(xiii) fruit size (small, medium, large, very large);

(xiv) average fruit weight (grams);

(xv) average fruit pressure (kg/m3);

(xvi) average fruit brix (% total soluble solids); and

(xvii) pest and disease tolerance or susceptibility.

6.2 **Vegetatively Propagated Rootstocks and Seedling Rootstocks**

An assessment by APFIP of trueness to type in respect of Rootstocks will be based on the following parameters:

(i) growth habit (upright, spreading, weeping);

(ii) tree vigour (weak, medium, strong, very strong);

(iii) appearance of branching (filiform);

(iv) internode length (short, medium, long, very long);

(v) roots (brittle);

(vi) leaf size (small, medium, large, very large);

(vii) variety compatibility;

(viii) disease tolerance / susceptibility;

(ix) multiplication techniques (layer beds, cuttings); and

(x) the presence or absence of spines.

SCHEDULE 7

Specific Certified Tree Requirements

In addition to the requirements set out in item 2.5 of Schedule 2, each Certified Tree must meet the following minimum specifications before being sold. These specifications are dependent on the age of the tree and on the age of the Rootstock and the Scion/Budwood used to produce the Certified Tree.

7.1 **One year old Certified Tree where both the Rootstock and the Scion/Budwood are at least one year old**

Trees are to be straight.

7.2 **Two year old Certified Tree with a Rootstock which is at least two years old and Scion/Budwood which is at least one year old**

(a) Three branches distributed evenly around the tree.

(b) The lowest branch is to be a minimum of 700mm from the ground; this may vary according to the growing characteristics of the variety.

(c) Branches are to meet the "three to one" rule (that is, branches must have a diameter of no more than 30% of the trunk diameter).

7.3 **Two year old Certified Tree where both the Rootstock and the Scion/Budwood are at least two years old**

(a) Six branches distributed evenly around the tree.

(b) The lowest branch is to be a minimum of 800mm from the ground; this may vary according to the growing characteristics of the variety.

(c) Branches are to meet the "three to one" rule (that is, branches must have a diameter of no more than 30% of the trunk diameter).

SCHEDULE 8

Minimum Certified Rootstock Requirements

8.1 **General**

For the purpose of this schedule:

1. The diameter of a Rootstock is to be measured 200mm from the base of the Rootstock once harvested.

2. There are two Rootstock size ranges:

   (a) Rootstocks which are smaller than 10mm in diameter are considered liner size and planted for one growing season before budding or grafting; or

   (b) Rootstocks which are over 10mm and less than 15mm are considered graftable size can be used for grafting in the year of harvest.

8.2 **Minimum Specifications**

The following minimum specifications must be met before Certified Rootstocks may be sold:

(a) Rootstocks are to be inspected for any sign of damage or disease. Rootstocks with more than 50mm of damaged bark are to be discarded.

(b) Rootstocks are to be straight and:

   (i) in respect of graftable size Rootstocks, free of spines to a minimum height of 450mm; or

   (ii) in respect of liner size Rootstocks, free of spines for the entire length of the liner size Rootstock.

(c) The base of the tree is to be inspected to ensure there is no major damage from harvesting; it should be a clean cut.

(d) A small root system should be present on all Rootstocks, ideally with roots growing from a minimum of three plant nodes.

(e) The minimum length for liner size Rootstocks is 250mm and 400m for graftable size Rootstocks.

SCHEDULE 9

Virus Treatment Procedure

Trees and Rootstocks shall be treated for each of the Viruses by a virus treating organisation approved by APFIP from time to time at APFIP's sole and unfettered discretion.

In determining whether to approve a virus treating organisation, APFIP may consider whether the organisation, in APFIP's sole and unfettered discretion, is an organisation with the required skill, expertise and experience to treat the Viruses using the latest virus treatment techniques reasonably available from time to time.

APFIP shall use all reasonable endeavours to ensure that the virus treating organisation shall disclose results of the treatment to APFIP or an Approved User.

SCHEDULE 10

Virus Testing Procedure

Trees and Rootstocks shall be tested as negative for each of the Viruses by a virus testing organisation approved by APFIP from time to time at APFIP's sole and unfettered discretion.

In determining whether to approve a virus testing organisation APFIP may consider whether the organisation, in APFIP's sole discretion, is an organisation with the required skill, expertise, and experience to test for the presence of each of the Viruses using the latest virus testing procedures reasonably available from time to time.

APFIP shall use all reasonable endeavours to ensure that the virus testing organisation shall disclose results of the treatment to APFIP or an Approved User.

SCHEDULE 11

Tree Segregation and Soil History Requirements

11.1 Trees and Rootstocks

Trees and Rootstocks are to be separated at all times from non Nuclear Stock and non Propagation Stock Trees:

(a) by a minimum of 30 metres; or

(b) where a barrier that prevents root penetration exists, 10 metres.

11.2 Soil History

Field grown Rootstocks and Trees are to be grown in soil that has not hosted plants of the species *Malus, Pyrus* or *Cydonia* in the previous six years.

If pots are to be used at any time to grow Rootstocks and Trees, the soil medium is to be sterilised.

SCHEDULE 12

Testing and Treatment for Pests and Diseases

12.1 Visual inspection for the Pests and Diseases and other pests and diseases are to be carried out at regular intervals. Any infections are to be recorded.

12.2 If visual inspection reveals that a Pest or Disease is present in a Tree or Rootstock, the infected Tree or Rootstock shall be treated by a recognisable agronomic treatment for the diagnosed Pests and Diseases until such time as the Pests and Diseases are no longer evident. Such treatment may include, but not be limited to, treatment by chemicals which have been registered for the purpose of eliminating the diagnosed Pests or Diseases.

12.3 Records of infections and any corrective action which is taken are to be made available in accordance with Schedule 13.

SCHEDULE 13

Records

Approved Users are required to keep records which are organised and maintained in such a way that the following information can be readily supplied to APFIP:

(a) The location (within the nursery premises) of any Nuclear Stock Trees, Propagation Stock Trees and Certified Trees.

(b) The parentage of the Scion/Budwood and/or Rootstocks.

(c) The requirements set by Schedules 2, 3 and 4, as applicable, have been met.

(d) The volume of Scion/Budwood collected from each Propagation Stock Tree.

(e) The lifting date of Certified Trees and the records of grading. Certified Trees are to be graded separately from non certified trees.

(f) Storage records of Certified Trees and/or Rootstocks. Certified Trees and/or Rootstocks are to be segregated from non-certified plants in storage areas.

(g) Delivery records demonstrating that Certified Trees and Certified Rootstocks are to be sold in accordance with the conditions specified in Schedules 2, 3 and 4.

(h) Observations of Pests and Diseases along with corrective actions specified in Schedule 12.

(i) Results of the virus indexing undertaken in accordance with Schedule 14.

(j) Records demonstrating and documenting treatment of the Viruses in accordance with Schedule 9.

(k) Locations of original trees.

(l) Details of the Approved User's right to produce, reproduce, propagate, sell or import the Tree or Rootstock.

(m) Certified Tree tag orders and records of placement on certified Trees and Rootstocks

SCHEDULE 14

Virus Indexing

This schedule sets out the frequency for which Trees and Rootstocks are to be tested for each of the Viruses in accordance with Schedule 10.

14.1 Trees

Trees are to be indexed so that all trees of the same generation are tested in accordance with Schedule 10 at least once in a five year period.

14.2 Rootstocks

Rootstocks are to be indexed so that all Rootstocks of the same generation are to be tested in accordance with Schedule 10 at a rate of one in every 2,000 Rootstocks of the same generation.

The annual sampling sites are to be marked and recorded. Samples are to be taken in a grid system across the production beds.

ANNEXURE A

Certification Trade Mark Licence Agreement

AUSTRALIAN POME FRUIT IMPROVEMENT PROGRAM LIMITED

ACN 077 345 174

HALL & WILCOX
Lawyers

Level 19
Bourke Place
600 Bourke Street
MELBOURNE VIC 3000
DX 320

Telephone (03) 9603 3555
Facsimile (03) 9670 9632
www.hallandwilcox.com.au

BJH MJM 464029.1

Table of Contents

This Agreement is dated # and made

Between

Australian Pome Fruit Improvement Program Limited ACN 077 345 174 of 35 Fourteen Turn Creek, Grove, Tasmania ("APFIP")

and:
of # ("the Licensee")

Recitals

A. Two of APFIP's key objects are to:

(iii) develop and promote independent evaluation of pome fruit propagation material for the Australian pome fruit industry; and

(iv) develop and promote standards for pome fruit material that will assist the international competitiveness of the Australian pome fruit industry.

B. APFIP is the owner of all rights in the Trade Mark.

C. The Trade Mark is registered as a trade mark pursuant to part 16 of the *Trade Marks Act* 1995 (Cth) .

D. The Licensee is a nursery or other similar organisation which has applied for and been granted Approved User status by APFIP in accordance with the Rules.

E. The Licensee has agreed to use the Trade Mark only in association with Certified Trees, Certified Vegetatively Propagated Rootstocks and/or Certified Seedling Rootstocks.

F. APFIP has agreed to grant to the Licensee a licence to use the Trade Mark on the terms and conditions of this Agreement.

Terms of this Agreement

1. Definitions and Interpretation

1.1 Save for clause 1.2 and unless the context otherwise dictates, where the first letters of a term or a word are capital letters, that term or word has the same meaning as prescribed in the Rules.

1.2 In this Agreement, including the Recitals, Schedules and Annexures, unless the context otherwise requires:

"**Agreement**" means this licence;

"**Bureau**" means the Australian Bureau of Statistics;

"**Commencement Date**" means the date of this Agreement;

"**Control**" in relation to a person or entity means direct or indirect control of that person or entity, including control that is exercisable as a result of or by means of arrangement or practices, whether having legal or equitable force and whether or not based on legal or equitable rights;

"**Fee**" means the fee payable pursuant to clause 6;

"**Review Date**" means each date during the Term which is an anniversary of the Commencement Date;

"**Rules**" means the rules governing the use of the Trade Mark (a copy of which has been given to the Licensee); and

"**Term**" means 5 years from the Commencement Date.

1.3 In this Agreement, including the Recitals, Schedules and Annexures, unless the context otherwise requires -

(a) a word denoting the singular includes the plural and vice versa;

(b) a word denoting an individual or person includes a corporation, firm, authority, government or governmental authority and vice versa;

(c) a word denoting a gender includes all genders;

(d) a reference to a recital, clause, schedule or annexure is to a recital, clause, schedule or annexure of or to this Agreement;

(e) a reference to any party to this Agreement, or any other document or arrangement, includes that party's executors, administrators, substitutes, successors and permitted assigns;

(f) headings are for convenience of reference only and do not affect interpretation; and

(g) where an expression is defined, another part of speech or grammatical form of that expression has a corresponding meaning.

2. Condition Precedent for Grant of Licence

A Licence shall only be granted by APFIP if APFIP has determined that the Licensee is an Approved User in accordance with clause 6 of the Rules.

3. Grant of Licence

3.1 Subject to clause 2, APFIP grants to the Licensee a non-exclusive licence to use the Trade Mark in Australia on the terms and conditions of the Rules and this Agreement.

3.2 Section 26 of the Act does not apply.

3.3 The Licensee acknowledges that it will be bound by the Rules.

4. The Rules

Subject to the law, this Agreement is subject to the Rules. Where there is an inconsistency between this Agreement and the Rules, the Rules shall prevail to the extent of the inconsistency.

5. Term

This Agreement commences on the Commencement Date and shall continue in full force for the Term.

6. Fee

Subject to clause 7 and in consideration of the grant of the Licence and the issuing of a Certification Tag, the Licensee shall pay to APFIP a fee of:

(a) $0.55 for each Certification Tag issued in respect of each nursery Tree; and/or

(b) $10.00 for each Certification Tag issued in respect of each Rootstock Bundle.

7. Review of Fee

7.1 The Fee to apply from each Review Date shall be an amount calculated as follows:

$$A = M \times \frac{N}{D}$$

where:

A is the Fee to apply from the Review Date;

M is the Fee payable immediately prior to the Review Date;

N is the Consumer Price All Groups Index for Melbourne published by the Bureau in respect of the quarter ending immediately prior to the Review Date; and

D is the Consumer Price All Groups Index for Melbourne published by the Bureau in respect of the quarter ending immediately prior to the last preceding Review Date or in the case of the first review of the Fees,

the quarter ending immediately prior to the Commencement Date of this Agreement,

provided that:

if the Bureau amends the reference base of the Consumer Price All Groups Index for Melbourne then, to preserve continuity of calculation, N shall be adjusted arithmetically to make N at the Review Date correspond with the reference base to D; and

if the Bureau ceases to calculate or publish the Consumer Price All Groups Index for Melbourne, there shall be substituted an index agreed upon by APFIP and the Licensee or, in default of agreement, selected by an expert appointed by the President of the Law Institute of Victoria as an index which most closely reflects changes in the cost of living in the City of Melbourne. All costs incurred in selecting an index as aforesaid shall be borne equally by the parties.

7.2 Until the Fees payable by applying clause 7.1 have been determined, the Licensee shall pay to APFIP the Fees as determined for the previous year.

7.3 Within 14 days of the publication of N by the Bureau, the Licensee shall pay to APFIP the amount (if any) which equals the difference between the Fees actually paid since the Review Date and the Fees calculated as payable for such period by applying clause 7.1.

8. Sub-Licensing and Assignment

8.1 The Licensee shall not sub-licence the right to use the Trade Mark.

8.2 The Licensee shall not assign any rights under this Agreement except with the prior written consent of APFIP, which consent may be given or withheld at its absolute discretion and subject to any terms and conditions that APFIP thinks fit.

8.3 Subject to the Act, APFIP may, at its absolute discretion, assign the right to use the Trade Mark.

9. Infringement

9.1 The Licensee shall immediately give written notice to APFIP of any infringement or threatened infringement of the Trade Mark which may come to the Licensee's knowledge.

9.2 APFIP may, at its sole and unfettered discretion, institute or defend any legal proceedings for infringement of or otherwise relating to the Trade Mark.

9.3 APFIP is under no obligation to institute or defend any legal proceedings whether for infringement of or otherwise relating to the Trade Mark.

9.4 If APFIP takes any proceeding in respect of any infringement of the Trade Mark, the Licensee shall do all things and give all assistance as reasonably may be required to assist APFIP taking that proceeding.

9.5 Any damages or compensation arising from that proceeding shall be paid to and held solely for the benefit of APFIP.

9.6 The Licensee shall not institute or defend any legal proceedings for infringement of or otherwise relating to the Trade Mark.

10. Rights in Trade Mark

10.1 The Licensee acknowledges that APFIP owns all rights in the Trade Mark.

10.2 Any and all goodwill which accrues from the use the Trade Mark by the Licensee shall accrue for the benefit of APFIP.

10.3 The Licensee shall not -

(a) breach, or encourage or permit any breach of, the rights in the Trade Mark;

(b) challenge APFIP's rights in, or ownership of, the Trade Mark; or

(c) use the Trade Mark for purposes outside the scope of this Agreement.

10.4 APFIP shall pay all renewal and other fees necessary to maintain the registration of the Trade Mark.

11. Licensee's Obligations and Warranties

11.1 The Licensee shall not attempt to register or use any trade mark, business name, corporate name or style or get up which is substantially identical or similar in any way to the Trade Mark except with the prior written approval of APFIP.

11.2 The Licensee shall use the Trade Mark in accordance with the terms and conditions of this Licence and shall comply with all reasonable directions issued by APFIP from time to time regarding the manner of use of the Trade Mark.

11.3 The Licensee must not use any trade mark, logo or name in conjunction with the Trade Mark except with the prior written approval of APFIP.

11.4 The Licensee will use its best endeavours to preserve the value and validity of the Trade Mark and in particular will -

(a) endeavour to create, promote and retain the goodwill in the business relating to the production, marketing and sale of Certified Trees and Certified Rootstocks; and

(b) not use the Trade Mark in such a manner that the goodwill in the Trade Mark is diminished.

11.5 The Licensee will not apply to revoke or de-register the Trade Mark or contest the validity of the Trade Mark.

11.6 The Licensee warrants that it:

(a) is not in default under its constitution (if any) and any replaceable rules or any statute (including, but not limited to the *Plant Breeder's Rights Act 1994* (Cth)) or under any decree, order, rule, by-law or regulation of any government, statutory, municipal body or organisation having jurisdiction over the Licensee or its business and the entering into this Agreement will not result in a contravention of any of the foregoing;

(b) holds all licences, permits, authorisations and consents required for the conduct of all aspects of its business and to the best of the knowledge of the Licensee all such licences, permits and authorisations required by the it are in full force and effect;

(c) shall only use the Trade Mark in association with Certified Trees or Certified Rootstocks;

(d) shall ensure that a Certification Tag is applied to:

(i) each Tree sold or promoted by the Licensee which meets the requirements for Certified Trees under the Rules including (without limitation) the requirements set out in Schedule 2 and Schedule 7 of the Rules; and

(ii) each Bundle of Rootstock sold or promoted by the Licensee which meets the requirements for Certified Rootstock under the Rules including (without limitation) the requirements set out in Schedules 3, 4 and 8 of the Rules;

(e) shall not sell Rootstock in quantities of less than one Bundle, unless it obtains APFIP's prior written consent to the sale; and

(f) shall comply with the Rules at all times.

12. Termination

APFIP may terminate this Agreement by notice in writing to the Licensee in any of the following circumstances:

(a) the non-payment of any Fees which are due to APFIP by the Licensee and are unpaid within 30 days from the date those Licence Fees were due and payable;

(b) the Licensee -

(i) stops or suspends payment of all or a class of its debts; or

(ii) is insolvent or bankrupt;

(c) an application or order is made, proceedings are commenced, a resolution is passed or proposed in a notice of meeting or an application to a court or other steps are taken for the dissolution of the Licensee or for it to enter an arrangement, compromise or composition with or assignment for the benefit of its creditors or any of them;

(d) there is a material change in Control of the Licensee;

(e) the Licensee commits a material breach of this Agreement and, if the breach is capable of being remedied, the Licensee fails to remedy the breach within 14 days after being required to do so;

(f) fraudulent conduct by the Licensee, including conduct in connection with its application for the granting of this Licence pursuant to the Rules, including a wilful and material falsification or error by the Licensee of any report, statement or other written data furnished to APFIP;

(g) the Licensee conducting its business in any way that endangers public health or safety;

(h) the Licensee voluntarily abandoning its business;

(i) the Licensee agreeing to terminate this Agreement;

(j) the Licensee, or a member of its staff, is convicted in a court of law of an offence where, in the reasonable opinion of APFIP, that conviction materially and adversely affects APFIP or the good name, goodwill or good reputation of APFIP or the Trade Mark;

(k) the Licensee fails to comply with or is breach of the Rules (including, but limited to clauses 3, 4, 5 and 8);

(l) where APFIP is not satisfied that the Licensee is using the Trade Mark exclusively in association with Certified Trees and/or Certified Rootstocks; or

(m) the Licensee is in breach of clause 11.

13. Consequences of Termination

13.1 Upon termination under clause 12 for any reason, the Licensee shall immediately:

(a) cease using the Trade Mark in any way;

(b) either destroy or return to APFIP all relevant packaging bearing the Trade Mark including, but not limited to, all Certification Tags which have previously been issued; and

(c) cease to be an Approved User.

13.2 The Licensee shall not be relieved of any obligation to make payments of Fees under clause 6.

13.3 The termination of this Agreement will be without prejudice to any other rights of APFIP under this Agreement prior to the date of termination, including the right to pursue all remedies available to APFIP at law or in equity.

14. Indemnities and Product Liability

14.1 The Licensee shall be liable for and shall indemnify and will keep indemnified APFIP, its servants, agents and employees, from and against any and all liabilities, losses, damages, costs, legal costs, professional and other expenses of any kind whatsoever incurred or suffered by APFIP whether direct or consequential (including but without limitation to any economic loss of other loss of profits, business or goodwill) arising out of any dispute or contractual, tortious or other claims or proceedings brought against APFIP by a third party claiming relief against APFIP arising directly or indirectly from the Licensee's use of the Trade Mark or Trees or Rootstocks which are selected, maintained and/or produced by the Licensee.

14.2 The Licensee acknowledges that the grant of this Licence does not constitute a warranty or guarantee by APFIP that:

(a) Trees or Rootstocks are:

(i) free of the Viruses of any other viruses;

(ii) free of the Pests and Diseases or any other pests and diseases; or

(b) use of any Trees, Rootstocks and/or Scion/Budwood is in any way compliant with or authorised under any law including but not limited to, *the Plant Breeders' Rights Act (Cth) 1994*.

14.3 APFIP does not by the grant of this Licence or by approval of any product, accept any liability to the Licensee or any other party for any damage, loss or injury caused as a result of the use of any product (including the Trees and Rootstocks).

15. Notices

15.1 Any notice, demand, consent or other communication ("the Notice") given or made under this Agreement shall be in writing and shall be given by one of the following means:

(a) by delivering it to the address of the party on a business day during normal business hours;

(b) by sending it to the address of the party by pre-paid first class post;

(c) by sending it by facsimile transmission to the facsimile number of the party; or

(d) by sending it by electronic mail to the e-mail address of the party.

15.2 A notice shall be taken to be duly given and received -

(a) in the case of delivery, when delivered;

(b) in the case of pre-paid first class post, five business days after the date of posting;

(c) in the case of facsimile, on receipt by the sender of a transmission report from the dispatching machine showing the relevant number of pages, the correct destination facsimile machine number and that the transmission was successful; and

(d) in the case of electronic mail, on acceptance by the recipient,

provided that if, in accordance with this sub clause, any such notice, demand, consent or other communication would otherwise be deemed to be given or made outside the recipient's working hours, such notice, demand, consent or other communication shall be deemed to be given or made at the start of the recipients normal working hours on the next business day.

15.3 For the purposes of this clause 15.3, the addresses of the parties shall be as follows:

In the case of APFIP –

Australian Pome Fruit Improvement Program Limited

Level 1, 8/16 Main Street (Po Box 273)
Huonville
TASMANIA 7109
Fax # 0362641143
E-mail # mark@apfip.com.au
Attention: National Coordinator

In the case of the Licensee

#
Fax #
E-mail #
Attention: #

15.4 A party may notify the other part to this Agreement of a change to its name, relevant addressee, address, facsimile number or e-mail address for the purposes of this clause 15 provided that such notification shall only be effective on:

(a) the date specified in the notification as the date on which the change is to take place; or

(b) if no date is specified or the date specified is less than five business days after the date on which notice is given, the date falling five business days after notice of any such change has been given.

16. Variation

This Agreement may be amended or varied from time to time by agreement in writing signed by the parties.

17. Waiver

The failure of any party at any time to require performance of the other party of a provision of this Agreement shall not constitute a waiver of that party's rights under the Agreement.

18. Relationship of the Parties

Nothing contained in this agreement shall constitute or be deemed to constitute the parties as partners or joint venture parties and the Licensee shall have no power to incur any obligations on behalf of APFIP in any manner whatsoever.

19. Dispute Resolution

19.1 Subject to clause 11 of the Rules, if any dispute arises between the parties to this Agreement as to the construction of this Agreement or as to any matter or thing of whatever nature arising under or in connection with this Agreement then such dispute shall, unless resolved within 21 days from the date on which notice of the dispute is given by a party, be referred for mediation in accordance with the *Mediation and Conciliation Rules* for the time being of the Institute of Arbitrators & Mediators of Australia at the request of any party to the dispute, to:

(a) a mediator agreed on by the parties to the Dispute; or

(b) if the parties to the Dispute are unable to agree on a mediator within seven days of the expiry of such notice, a mediator appointed by the then current the President of the Law Institute of Victoria or a person of an equivalent position at an equivalent organistaion of another State as determined by APFIP at APFIP's sole and unfettered discretion,

provided that the mediation is commenced within seven days of the referral or such later time as agreed by the parties to the Dispute.

20. GST

20.1 The value of any consideration payable or to be provided by a party under or in connection with this Agreement is the value for GST purposes of any taxable supply to which that consideration relates.

20.2 Unless expressly provided to the contrary in this Agreement, any consideration payable or to be provided by a party under or in connection with this Agreement:

(a) stated as a figure, is stated exclusive of GST; or

(b) described (by formula or otherwise), is described and must be calculated without regard to GST.

20.3 Where this Agreement requires a party ("the first party") to provide consideration to any other party ("the second party") in respect of a taxable supply made or to be made by the second party, the second party may, subject to issuing a valid tax invoice, recover at the same time (or at such later time as a valid tax invoice is presented) from the first party an additional amount on account of GST, such amount to be calculated by multiplying the consideration payable or to be provided by a party in respect of such taxable supply by the prevailing GST rate.

20.4 For the purposes of this clause 20:

(a) "GST" means GST within the meaning of the GST Act; and

(b) "GST Act" means *A New Tax System (Goods and Services Tax) Act 1999* (as amended)

21. Severance

If any provision of this Agreement is found to be unenforceable or invalid, the validity of the remaining provisions shall not be affected.

22. Entire Agreement

This Agreement constitutes the entire agreement between the parties with respect to the subject matter in this Agreement and supersedes all previous communications, representations, involvements and undertakings (including any previous licence agreement) between the parties or their respective officers or agents.

23. No Merger

The rights and obligations of the parties in respect of agreements, indemnities, covenants and warranties contained in this Agreement shall remain in full force and effect, be continuing agreements, indemnities, covenants and warranties and not be merged or extinguished by or upon termination of, or completion of any obligations under, this Agreement.

24. Applicable Law or Jurisdiction

24.1 Regardless of the place of performance or otherwise, this Agreement shall be governed by the laws of the State of Victoria and the Commonwealth of Australia and each party submits to the non-exclusive jurisdiction of courts exercising jurisdiction in Victoria and the Commonwealth of Australia in connection with matters concerning this Agreement.

24.2 This clause is without prejudice to or limitation to the rights of APFIP to commence proceedings or other action the Licensee in any jurisdiction.

25. Costs

Each party shall pay its own legal and other costs and expenses in connection with the preparation of this Agreement, except that any stamp duty payable on the Agreement shall be paid by the Licensee.

EXECUTED by **AUSTRALIAN POME FRUIT IMPROVEMENT PROGRAM LIMITED ACN 077 345 174** in accordance with the *Corporations Act 2001* by being signed by the following officer(s):

..... Director

..... Director/Company Secretary

OR

..... Sole Director and Sole Company Secretary

EXECUTED by **# PTY LIMITED ACN #** in accordance with the *Corporations Act 2001* by being signed by the following officer(s):

..... Director

..... Director/Company Secretary

OR

..... Sole Director and Sole Company Secretary

2- APFIP Evaluation Deed

AUSTRALIAN POME FRUIT IMPROVEMENT PROGRAM LTD.
ACN 077 345 174

and

THE PARTY OR PARTIES NAMED AND DESCRIBED IN ITEM 1 OF THE SCHEDULE

DEED FOR THE EVALUATION OF PLANT MATERIAL

HALL & WILCOX
Lawyers
Level 19
Bourke Place
600 Bourke Street
MELBOURNE VIC 3000
DX 320

Telephone (03) 9603 3555
Facsimile (03) 9670 9632
E-mail handw@hallandwilcox.com.au

AEM [202] # 66341.5

QF 34 Evaluation Deed
Version 10
Issue Date: 21st of April 2009

THIS DEED is made

BETWEEN

AUSTRALIAN POME FRUIT IMPROVEMENT PROGRAM LTD. ACN 077 345 174 of 35 Turn Creek Road, Grove, Tasmania ("APFIP")

AND

THE PARTY OR PARTIES NAMED AND DESCRIBED IN ITEM 1 OF THE SCHEDULE ("the Owner")

RECITALS

A. APFIP is a company limited by guarantee with objects including the following:

- to develop and promote independent evaluation of pome fruit propagation material for the Australian pome fruit industry; and
- to develop and promote standards for pome fruit propagation material that will assist the international competitiveness of the Australian pome fruit industry.

B. To further its objects, APFIP operates the APFIP Regional Evaluation Program.

C. Regional Custodians are responsible for establishing, evaluating and maintaining Material under the APFIP Regional Evaluation Program.

D. The APFIP Regional Evaluation Program is administered by APFIP Regional Evaluation Groups.

E. The Owner is the owner or the agent of the owner of the plant breeder's rights and all other intellectual and industrial property rights in the Material.

F. In accordance with the APFIP Regional Evaluation Program, APFIP and the Owner have agreed that the Owner is to provide APFIP with the Material for the purposes of evaluation at the Location on the terms and conditions of this Deed.

TERMS OF THIS DEED

1. DEFINITIONS AND INTERPRETATION

1.1 In this Deed, including the Recitals, Schedules and Annexure, unless the context otherwise requires:

"**APFIP Regional Evaluation Group**" means a regional committee established by APFIP, comprising of members appointed by APFIP, for the purpose of overseeing the APFIP Regional Evaluation Program in a particular region;

"**APFIP Regional Evaluation Procedures**" means the procedures for the conduct of the APFIP Regional Evaluation Program listed in Annexure "A", as amended by APFIP from time to time pursuant to clause 14;

"**APFIP Regional Evaluation Program**" means the program established by APFIP for the evaluation of Material in accordance with the objects of APFIP;

"**Information**" means information gathered by APFIP as a result of its carrying out of the evaluation of the Material;

"**Location**" means the site or sites where the Material is to be evaluated as described in item 3 of the Schedule;

"**Material**" means the pome fruit propagation Material to be evaluated under the APFIP Regional Evaluation Program as described in item 2 of the Schedule; and includes mutations and sports of the propagating material the fruit, the seeds and all additional plants that may seed, be grown from cuttings or in any other way propagated from the material.

"**Regional Custodian**" means the person appointed as regional custodian by APFIP to be responsible for establishing, evaluating and maintaining the Material under the APFIP Regional Evaluation Program.

1.2 In this Deed, including the Recitals, Schedules and Annexure, unless the context otherwise requires:

(a) a word denoting the singular includes the plural and vice versa;

(b) a word denoting an individual or person includes a corporation, firm, authority, government or governmental authority and vice versa;

(c) a word denoting a gender includes all genders;

(d) a reference to a recital, clause, schedule or annexure is to a recital, clause, schedule or annexure of or to this Deed;

(e) a reference to any party to this Deed, or any other document or arrangement, includes that party's executors, administrators, substitutes, successors and permitted assigns; and

(f) a reference to "dollars" or "$" is to an amount in Australian currency.

2. **SUPPLY OF MATERIAL FOR EVALUATION**

2.1 (a) The Owner hereby agrees to supply to APFIP the Material at the Location to enable APFIP to evaluate the Material in accordance with the APFIP Regional Evaluation Program and the APFIP Regional Evaluation Procedures.

(b) The Owner agrees that for the purpose of clause 2.1(a), APFIP shall be permitted to grow the Material but in no other way shall be involved in the propagation of the Material.

2.2 The number of trees to be evaluated by APFIP shall be that listed in item 4 of the Schedule.

2.3 APFIP agrees to evaluate the Material in accordance with the APFIP Regional Evaluation Procedures and, to this end:

(a) APFIP will appoint a Regional Custodian to establish, evaluate and maintain the Material at the Location; and

APFIP will appoint an APFIP Regional Evaluation Group to oversee the evaluation of the Material at the Location in accordance with the APFIP Regional Evaluation Procedures.

2.4 Notwithstanding any other provision of this Deed, APFIP acknowledges and agrees that:

(a) it must not permit the Material to be propagated by the Regional Custodian or any other person; and

(b) the Owner may at any time by notice in writing to APFIP require that any or all of the Material is withdrawn for the operation of this Deed and the APFIP Regional Evaluation Program in which event the provision of Clause 9 of this Deed shall apply to the Material withdrawn.

3. **TERM**

3.1 This Deed came into force on the date it is executed and shall remain in force, subject to clause 11, for a period of 7 years.

3.2 The provisions of clauses 5 and 9 shall survive termination of this Deed.

4. **FEES PAYABLE BY OWNER**

4.1 In consideration of the evaluation services to be provided by APFIP and the provision of information by APFIP to the Owner, the Owner shall pay to APFIP an evaluation fee calculated as follows:

(a) 1 to 100 trees in evaluation - $16.50 per tree (annually incl. GST)

(b) 101 to 500 trees in evaluation - $13.75 per tree (annually incl. GST)

(c) 501 trees or over in evaluation - $11.00 per tree (annually incl. GST)

4.2 The evaluation fees payable pursuant to clause 4.1 shall be payable upon receipt of an invoice from APFIP and due by the 31st of May annually or upon termination of this Deed.

5. OWNERSHIP OF INTELLECTUAL PROPERTY

5.1 APFIP acknowledges and agrees that the plant breeder's rights and all other intellectual and industrial property rights in the Material improvements or alterations to the Material shall continue to be owned by the Owner.

5.2 (a) Notwithstanding clause 5.1, Information gathered by APFIP as a result of this Deed and evaluation of the Material shall be owned jointly by APFIP and the Owner.

(b) APFIP shall, at its sole and unfettered discretion but subject to clause 7.4, be entitled to make public the results of the evaluation of the Material.

5.3 APFIP must ensure that the Regional Custodian and each member of an APFIP Regional Evaluation Group evaluating the Material is obliged to execute a confidentiality and non-propagation deed in respect of the Material in a form provided by APFIP.

6. INFRINGEMENT

6.1 Both the Owner and APFIP shall immediately give written notice to the other party of any infringement or threatened infringement which may come to either party's knowledge in respect of the plant breeder's rights and all other intellectual and industrial property rights in the Material and any improvements or alterations to the Material.

6.2 Neither APFIP nor the Owner shall be under any obligation to institute or defend any legal proceedings whether for infringement of or otherwise relating to any of the intellectual property under clause 6.1.

6.3 (a) If either APFIP or the Owner at its own expense takes any proceedings in respect of any infringement of any of the intellectual property under clause 6.1, the other party shall do all things and give all assistance as reasonably may be required to assist the party taking that proceeding and the party taking the proceeding shall meet any reasonable expenses incurred by the other party in giving such assistance and that other party will if necessary to do so and at the request of the party taking the proceeding join either as co-plaintiff or as a defendant in and assist in such action, claim or proceeding subject to its being

indemnified by the party taking the proceeding in respect of all costs, expenses or other liabilities which it may reasonably incur as a result (such indemnity to be secured in a manner reasonably satisfactory to the other party) or otherwise assist the party taking the proceeding, save that where prompt action is required, such indemnity shall be secured as aforesaid or as soon as practicable thereafter.

(b) Any damages or compensation arising from that proceeding shall be paid to and held solely for the benefit of the party taking that action or proceeding.

7. **OBLIGATIONS OF APFIP**

7.1 APFIP must ensure that the Material is evaluated at the Location in accordance with the APFIP Regional Evaluation Procedures.

7.2 APFIP must ensure that services provided by both the Regional Custodians and the APFIP Regional Evaluation Group in respect of the evaluation of the Material are in accordance with the APFIP Regional Evaluation Procedures.

7.3 APFIP or the Regional Custodian shall sell no fruit produced from the Material.

7.4 Subject to clause 7.4 APFIP shall disseminate the Information gathered from the evaluation of the Material throughout the Australian apple and pear industry, including:

(a) publication in "Pome Fruit Australia" magazine; and

(b) publication in regional pome fruit newsletters and such other publications as determined by APFIP,

(c) via visitor access to the APFIP database that is available on the internet.

provided that all Information shall be used in good faith.

7.5 Prior to disseminating the Information gathered from the evaluation of the Material in accordance with clause 7.3, APFIP must provide the Owner with a reasonable opportunity to review the information. Dissemination of the Information can only proceed with the prior written consent of the Owner.

8. **OBLIGATIONS OF THE OWNER**

8.1 The Owner shall deliver the Material at the Owner's expense to the Location free of charge to APFIP.

8.2 The Owner shall provide evidence of the Owner's ownership of the Material to the satisfaction of APFIP.

9. **RETURN OF MATERIALS**

9.1 If APFIP ceases to require the Material for the APFIP Regional Evaluation Program or upon termination of this Deed, the Materials shall be:

(a) returned to the Owner forthwith; or

(b) disposed of in a manner agreed between APFIP and the Owner.

9.2 APFIP or the Regional Custodian shall sell no fruit propagated from the Material.

10. **INSPECTION**

APFIP shall permit the Owner or its authorised representative to access the Location for the purpose of inspection of the Material upon the giving of reasonable notice to APFIP.

11. **TERMINATION**

11.1 This Deed shall terminate forthwith upon any one of the following events:

(a) the dissolution or winding up of APFIP or the Owner for any reason whatsoever;

(b) if APFIP or the Owner becomes the subject of liquidation proceedings; or

(c) a breach by either party of one or more of the terms and conditions of this Deed, provided that the party in breach is notified in writing by the other party of the breach and such breach is not cured or a satisfactory resolution agreed upon in writing within seven days of such notice.

11.2 (a) In the event that APFIP varies the APFIP Regional Evaluation Procedures in accordance with clause 14 and such variation is not appropriate and in accordance with general industry standards should not be followed, the Owner may upon providing 60 days written notice to APFIP terminate this Deed.

(b) For the purposes of clause 11.2(a), the burden is on the Owner to establish that the variation to the APFIP Regional Evaluation Procedures is not appropriate and in accordance with general industry standards should not be followed. If APFIP does not accept the Owner's evidence on this point, the matter will be determined in accordance with the dispute resolution provisions set out in clause 12.

11.3 Either party may terminate this Deed by giving 60 days written notice of termination.

11.4 Any termination of this Deed pursuant to the provisions of this clause shall not prejudice the rights of either party against the other which may have accrued up to and including the date of such termination.

12. DISPUTE RESOLUTION

12.1 If any dispute or difference arises between the parties to this Deed as to the construction of this Deed or as to any matter or thing of whatever nature arising under or in connection with this Deed, then such dispute or difference shall, unless resolved within 21 days of the date upon which notice of the dispute or difference is given by a party to this Deed, be submitted to mediation in accordance with clause 12.2.

12.2 The mediation procedure shall be:

(a) a party may start mediation by serving a mediation notice on the other party;

(b) the notice must state that a dispute has arisen and identify what the dispute is;

(c) the parties must jointly request appointment of a mediator. If the parties fail to agree on the appointment within seven days of service of the mediation notice, either party may apply to the president of the Law Institute of Victoria to appoint a mediator;

(d) once the mediator has accepted the appointment the parties must comply with the mediator's instructions; and

(e) if the dispute is not resolved within 30 days of the appointment of the mediator, or any other period agreed by the parties in writing, the mediation ceases.

12.3 The mediator may fix the costs for mediation which must be paid equally by the parties.

12.4 If the dispute is settled, all parties must sign the terms of agreement and these terms are binding on the parties.

12.5 The mediation is confidential and statements made by the mediator or the parties and discussions between the participants to the mediation before after or during the mediation, cannot be used in the legal proceedings.

12.6 The mediator is not bound by the rules of natural justice and may discuss the dispute with a party in the absence of any other party.

13. APPLICABLE LAW

This Deed shall be governed and construed by and in accordance with the laws of the state of Victoria and the parties hereby submit to the exclusive jurisdiction of the courts of that state.

14. VARIATION OF APFIP REGIONAL EVALUATION PROCEDURES

14.1 APFIP may at any time, by notice in writing, vary the APFIP Regional Evaluation Procedures.

14.2 The APFIP Regional Evaluation Procedures shall form part of the terms of this Deed.

15. AMENDMENT

Subject to clause 14, this Deed shall not be modified or varied in any manner whatsoever except by a written document executed by the parties hereto and expressed to be supplemental to or in substitution for this Deed.

16. **ASSIGNMENT**

Neither party shall assign this Deed or any rights granted or to be granted pursuant to this Deed without the prior written consent of the other party, which consent shall not be unreasonably withheld.

17. **SEVERANCE**

If any part of this Deed is found to be in violation of public policy, or to be illegal, unenforceable, void or voidable in equity or law, then that part may be severed from this Deed and will not affect any other provisions or parts of this Deed.

EXECUTED AS A DEED

THE COMMON SEAL of **AUSTRALIAN POME FRUIT IMPROVEMENT PROGRAM LTD. ACN 077 345 174** was affixed in accordance with the *Corporations Law* in the presence of:)

..... Director

..... Director/Secretary

OR

..... Sole Director and Sole Secretary

SIGNED SEALED AND DELIVERED by # in the presence of:)

..... Witness

..... Print name of Witness

..... Print address of Witness

SCHEDULE

Item 1 **Owner**

of

Item 2 **Material**

#

Item 3 **Location**

Item 4 **Number of Trees**

Maximum 4 trees per site to be planted

Variety Evaluation Sites

	Minimum trees planted per variety	Cost per tree annually	
Lenswood South Australia Site 34°S elevation 400 metres *Mild Winter/Hot Summer Temps*	4	$ 50.00	Yes / No please circle

	Minimum trees planted per variety	Cost per tree annually	
Manjimup Western Australia Site 34°S elevation 240 metres *Mild Winter/Hot Summer Temps*	4	$ 50.00	Yes / No please circle

	Minimum trees planted per variety	Cost per tree annually	Site required
Goulburn Valley Victoria Site 36°S elevation 100 metres *Mild Winter/Hot Summer Temps*	4	no charge/Industry funded	

	Minimum trees planted per variety	Cost per tree annually	
Batlow New South Wales Site 35°S elevation 873 metres *Cold Winter/Warm Summer Temps*	4	$ 50.00	Yes / No please circle

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	Minimum trees planted per variety	Cost per tree annually	
Orange New South Wales Site 33°S elevation 933 metres *Cold Winter/Warm Summer Temps*	4	$ 50.00	Yes / No please circle
Stanthorpe Queensland Site 28°S elevation 877 metres *Cold Winter/Warm Hot Summer Temps*	4	$ 50.00	Yes / No please circle
Sidmouth Northern Tasmania Site 41°S elevation 132 metres *Cool Winter/Mild-Warm Summer Temps*	4	$ 50.00	Yes / No please circle
Huon Valley Tasmania Site 42°S elevation 20 meters *Cold Winter/Mild-Warm Summer Temps*	4	$ 50.00	Yes / No please circle
APFIP Material Repository Site 42°S elevation 20 meters *Cold Winter/Mild-Warm Summer Temps*	4	$ 50.00	Yes / No please circle

3. APFIP Evaluation DL

Australian Pome Fruit Improvement Program Australia

Evaluation

APFIP operates an independent, secure and efficient evaluation network which encompasses most major temperate tree fruit growing regions of Australia. Effective evaluation is vital: Australia is only a small producer accounting for around 0.5% of world apple production. Effective evaluation gives growers the information they require to make balanced decisions on variety choice relevant to their operations. The growing regions are small and located wherever climate and soil are suitable – from southern sub-tropical Queensland to the 'Roaring 40s' in Tasmania.

Where are we now?

We have an integrated system of independent and regional evaluation for apples and pears. An online database provides live reports automatically.

- 9 active sites
- 52 people in regional evaluation groups
- 7 active observers
- 102 varieties on trial (61 apple, 41 pear)
- 1272 trees in total
- 20 active suppliers

www.apfip.com.au/evaluation/database

Certification

Following extensive consultation in Australia, and evaluation of European certification systems, APFIP has introduced its own certification system for fruit tree propagation material which operates under this certification Trade Mark. APFIP licenses the use of the certification Trade Mark to producers of nursery trees and rootstocks.

The first rootstocks and varieties have been assessed for trueness to type and virus status, and are now being multiplied. They are the first propagation material to carry the certification Trade Mark.

Minimum nursery tree standards are also a requirement of certification. The minimum nursery tree standards are available in document for for download from www.apfip.com.au/certification/nursery.

To assist nursery tree producers in meeting the standards, APFIP co-ordinates a nursery tree group. This group is supplied with information about nursery techniques. If you would like to be part of this group please contact the General Manager *(see over page)*.

Post-Entry Quarantine

Pome fruit budwood (variety and rootstock) importation process.

Pome fruit budwood is classified as high security due to the risk of the introduction of Fire Blight and other exotic pests and diseases. A review of pome fruit budwood protocols was completed in February 2002. Changes in the importation protocols following the review resulted in a reduction of the post-entry quarantine time from 4 years to 15 months.

APFIP was an integral part of the review process and, in its role acting on behalf of the Australian pome fruit industry, has facilitated efficient entry of material into Australia. This is of enormous ongoing benefit to the industry.

www.apfip.com.au

4. Custodian Agreement

AUSTRALIAN POME FRUIT IMPROVEMENT PROGRAM LIMITED
A.C.N. 077 345 174

and

THE PARTY OR PARTIES NAMED AND DESCRIBED IN ITEM 1 OF THE SCHEDULE

REGIONAL CUSTODIAN DEED

Version 8 QF 13
Issue Date: 24th of August 2008

THIS DEED is made

BETWEEN

AUSTRALIAN POME FRUIT IMPROVEMENT PROGRAM LIMITED A.C.N. 077 345 174 of 35 Turn Creek Road, Grove, Tasmania ("APFIP")

AND

THE PARTY OR PARTIES NAMED AND DESCRIBED IN ITEM 1 OF THE SCHEDULE ("the Regional Custodian")

RECITALS

A. APFIP is a company limited by guarantee; two of its key objects are to:

* develop and promote independent evaluation of pome fruit propagation material for the Australian pome fruit industry; and

* develop and promote standards for pome fruit propagation material that will assist the international competitiveness of the Australian pome fruit industry.

B. To further its objects, APFIP operates the APFIP Regional Evaluation Program.

C. Owners of Material grant APFIP the right to evaluate Material.

D. APFIP appoints regional custodians to establish, evaluate and maintain Material under the APFIP Regional Evaluation Program.

E. The APFIP Regional Evaluation Program is administered by APFIP in consultation with Regional Evaluation Groups.

F. In accordance with the APFIP Regional Evaluation Program, APFIP and the Regional Custodian have agreed that the Regional Custodian is to provide the Services on the terms and conditions of this Deed.

TERMS OF THIS DEED

1. **DEFINITIONS AND INTERPRETATION**

(1) In this Deed, including the Recitals, Schedule and Annexures, unless the context otherwise requires -

"APFIP Regional Evaluation Group" means a regional committee established by APFIP for the purposes of overseeing the APFIP Regional Evaluation Program in a particular region and the provision of the Services by the Regional Custodian;

"APFIP Regional Evaluation Procedures" means the procedures for the conduct of the APFIP Regional Evaluation Program listed in Annexure "A", as amended by APFIP from time to time pursuant to clause 7;

"APFIP Regional Evaluation Program" means the program established by APFIP for the evaluation of Material in accordance with the objects of APFIP;

"Control" means an event which results in a change in the control of the Regional Custodian (where it is not a natural person) which, for the purposes of this Deed, shall occur when a third party (either individually or collectively with its associated companies) that is not a present member of the Regional Custodian, obtains the ability, directly or indirectly, to appoint the majority of directors to the board of the Regional Custodian or to hold more than 50% of the voting rights in the Regional Custodian;

"Material" means pome fruit propagation material to be evaluated under the APFIP Regional Evaluation Program as provided to the Regional Custodian by APFIP as described in item 3 of the Schedule and includes mutations and sports of the propagating material the fruit, the seeds and all additional plants that may seed, be grown from cuttings or in any other way be propagated from the material;

"Project Address" means the address set out in item 2 of the Schedule; and

"Services" means the services to be provided by the Regional Custodian as listed in clause 2(2).

(2) In this Deed, including the Recitals, Schedule and Annexures, unless the context otherwise requires -

(a) a word denoting the singular includes the plural and vice versa;

(b) a word denoting an individual or person includes a corporation, firm, authority, government or governmental authority and vice versa;

(c) a word denoting a gender includes all genders;

(d) a reference to a recital, clause, schedule or annexure is to a recital, clause, schedule or annexure of or to this Deed;

(e) a reference to any party to this Deed, or any other document or arrangement, includes that party's executors, administrators, substitutes, successors and permitted assigns; and

(f) a reference to "dollars" or "dollar sign" is to an amount in Australian currency.

2. **SERVICES**

(1) The Regional Custodian hereby agrees to provide the Services to APFIP at the Project Address.

(2) The Services to be provided by the Regional Custodian to APFIP shall be such services as directed by APFIP, including but not limited to the establishment, evaluation and maintenance of Material under the APFIP Regional Evaluation Program in accordance with the APFIP Regional Evaluation Procedures.

3. **TERM**

(1) This Deed comes into force on the date it is executed and shall remain in force, subject to clause 10, for a period of five years.

(2) The provisions of clause 5(3), 5(4), 5(5), 5(6), 6, 10(3) and 10(4) shall survive termination of this Deed.

4. CONSIDERATION

In consideration for the Regional Custodian providing the Services at the Project Address, APFIP shall remunerate the Regional Custodian in accordance with the APFIP Regional Evaluation Procedures.

5. WARRANTIES AND ACKNOWLEDGEMENTS

(1) The Regional Custodian warrants that it shall ensure that it provides the Services in compliance with the APFIP Regional Evaluation Procedures and any other reasonable requirements of APFIP notified to it from time to time.

(2) The Regional Custodian warrants to undertake responsibility at all times and in all respects for the Material and provision of the Services.

(3) The Regional Custodian warrants that it shall keep absolutely confidential all information the subject of this Agreement or relating to the Material, the APFIP Regional Evaluation Program and the APFIP Regional Evaluation Procedures unless otherwise authorised in writing by APFIP or as required by law.

(4) The Regional Custodian warrants that it shall not sell the Material or any fruit from it, nor itself nor allow any third party to undertake any form of propagation or distribution of Material (including the taking of cuttings, seeds, fruit or other matter relating to the Material) except for evaluation in accordance with the APFIP Regional Evaluation Procedures or as otherwise authorised in writing by APFIP in which regard the Regional Custodian must immediately notify APFIP in writing of any infringement, threatened infringement or reasonable suspicion of infringement of the requirements of this sub-clause (4).

(5) The Regional Custodian acknowledges that at all times the Material remains the property of the owner of the Material and no ownership or title vests in the Regional Custodian by virtue of this Deed.

(6) The Regional Custodian warrants that it is the registered proprietor of the Project Address, has the right to exclusively occupy the Project Address and has the right to enter this Deed.

(7) The Regional Custodian warrants that no less than 60 days prior to any proposed change of Control of the Regional Custodian, sale of the business of the Regional Custodian or change of Control or ownership of the Project Address, that the Regional Custodian will give written notice to APFIP of such proposal.

(8) The Regional Custodian indemnifies APFIP in respect of all claims, loss or damage that may be suffered directly or indirectly by APFIP as a result of a breach of any of these warranties including, but not limited to, legal and other costs incurred by APFIP to gain entry to the Project Address for the purpose of removing the Material.

6. **INSPECTION**

(1) The Regional Custodian shall permit any person authorised by APFIP (including the owner of the Material) to enter the property at the Project Address and inspect or remove the Material at any time as required by APFIP upon the giving of reasonable notice by APFIP.

(2) The Regional Custodian acknowledges and agrees that the right of APFIP, or any person authorised by APFIP, to enter the property at the Project Address

conferred under clauses 6(1) and 10(3) constitutes a *profit a prendre* over the property at the Project Address in favour of APFIP.

(3) The Regional Custodian hereby grants a charge in favour of APFIP in respect of the Project Address for the purposes of APFIP securing its rights under clause 6(1) and 10(3).

(4) The rights granted to APFIP under clauses 6(1) and 10(3) and 6(3) will cease upon APFIP, or its representative, removing all of the Material from the Project Address.

7. **VARIATION OF APFIP REGIONAL EVALUATION PROCEDURES**

(1) APFIP may at any time, by notice in writing, vary the APFIP Regional Evaluation Procedures.

(2) The APFIP Regional Evaluation Procedures as amended shall form part of the terms of this Deed.

8. **REGULATIONS**

The Regional Custodian shall comply with the requirements, rules and regulations of any and all authorities or other government bodies having jurisdiction over the APFIP Regional Evaluation Program, the Material and the Services.

9. **INSURANCE**

(1) The Regional Custodian shall effect at its own cost a public liability insurance policy which shall cover liability to the public for an amount not less than $5 million in respect of all accidents occurring at the Project Address or arising out of or in the course of or caused by the carrying out of the Services including -

(a) death or bodily injury (including illness) to any person not being a person who at the time of the accident is engaged in or upon the service of the insured under a notice of contract of service or apprenticeship; or

(b) damage to property not belonging to nor held in trust by nor in the custody or control of the insured.

(2) The Regional Custodian shall effect an insurance policy for an unlimited amount against any liability, loss, claim or proceedings whatsoever, whether arising by virtue of any statute relating to workers' compensation or employers' liability or at common law by any person employed by the Regional Custodian in or about the carrying out of the Services, and shall ensure that every sub-contractor (whether or not a nominated sub-contractor) is insured against any such liability.

(3) The insurance policies referred to in this clause shall be effected before the Services are commenced and shall be maintained for a minimum of 60 days after the completion of this deed.

(4) The Regional Custodian shall notify the APFIP in writing of the insurance policies taken out pursuant to this clause in the form annexed as Annexure "B".

10. **TERMINATION**

(1) Subject to sub-clause (2), this Deed shall terminate without notice upon any one of the following events:

(a) the dissolution or winding-up of APFIP for any reason whatsoever;

(b) APFIP becoming the subject of liquidation proceedings or having a receiver or manager appointed to APFIP;

(c) the death or permanent and total disablement of the Regional Custodian, if they are a natural person;

(d) a determination duly made by APFIP that the Services of the Regional Custodian are no longer required;

(e) a breach by either party of one or more of the terms and conditions of this Deed, provided that the party in breach is notified in writing by the other party of the breach and such breach is not cured or a satisfactory resolution agreed upon in writing within seven days of such notice;

(f) immediately prior to a change in Control of the Regional Custodian, if it is not a natural person;

(g) immediately prior to a change in ownership or cessation of the business of the Regional Custodian in conjunction with which the Services would reasonably be expected to be provided; or

(h) immediately prior to a change in Control or ownership of the Project Address.

(2) Any termination of this Deed pursuant to the provisions of this clause shall not prejudice the rights of either party against the other which may have accrued up to and including the date of such termination.

(3) Upon termination and following termination, APFIP through its employees, agents, and contractors shall have an unrestricted right of entry to the Project Address (on as many occasions as it requires) for the purpose of removing the Material from the Project Address as soon as practicable following termination.

(4) The Regional Custodian shall assist APFIP, it's employees, agents and contractors in obtaining access to the Project Address for the purpose described in clause 10(3).

11 APPLICABLE LAW

This Deed shall be governed and construed by and in accordance with the laws of the state of Victoria and the parties hereby submit to the exclusive jurisdiction of the courts of that state.

12. AMENDMENT

Subject to clause 7, this Deed shall not be modified or varied in any manner whatsoever except by a written document executed by the parties hereto and expressed to be supplemental to or in substitution for this Deed.

13 ASSIGNMENT

Assignment of this Deed by the Regional Custodian is not permitted. APFIP can assign this deed to Apple & Pear Australia Limited without the consent of the Regional Custodian. The parties are to do whatever is reasonably necessary to give effect to an assignment by APFIP.

14. GST

(1) GST Definitions For the purposes of this clause:

(a) "**GST**" means GST within the meaning of the *GST Act*;

(b) "***GST Act***" means A New Tax System (Goods and Services Tax) Act 1999 (as amended); and

(c) Expressions set out in italics in this clause have the same meaning as those

expressions in the *GST Act*.

(2) Amounts payable do not include GST

To the extent that a party makes a *taxable supply* in connection with this Deed, except where express provision is made to the contrary, and subject to this clause, the *consideration* payable by a party under this Deed represents the value of the *taxable supply* for which payment is to be made.

(3) Liability to pay GST

Subject to clause 14(4), if a party makes a *taxable supply* in connection with this Deed for *consideration* which, under clause 14(2), represents its *value*, then the party liable to pay for the *taxable supply* must also pay, at the same time and in the same manner as the *value* is otherwise payable, the amount of any GST payable in respect of the *taxable supply*.

(4) Tax invoice

A party's right to payment under clause 14(3) is subject to a valid *tax invoice* being delivered to the party liable to pay for the *taxable supply*.

EXECUTED AS A DEED

EXECUTED by **AUSTRALIAN POME FRUIT IMPROVEMENT PROGRAM LIMITED** ACN 077 345 174 in accordance with the Corporations Act 2001 by being signed by the following officers:

..... Director

..... Director/Company Secretary

SIGNED SEALED AND DELIVERED)
by # in the presence of:) .....
)

.....Position

..... Witness

..... Print name of Witness

.....Print address of Witness

Australian Pome Fruit Improvement Program Ltd.

SCHEDULE

Item 1 **Regional Custodian**

Item 2 **Project Address**

Item 3 **Material**

As detailed in the site plan on the APFIP evaluation database at

https://evaluation.apfip.com.au

User Name:

Password:

Australian Pome Fruit Improvement Program Ltd.

ANNEXURE "A"

APFIP REGIONAL EVALUATION PROCEDURES

Australian Pome Fruit Improvement Program Ltd.

ANNEXURE "B"

INSURANCE

1. **PUBLIC LIABILITY/RISK POLICY**

   Insurance Company:

   Policy No:

   Expiry Date:

   Limit of Cover:

2. **WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY**

   Insurance Company:

   Policy No:

   Expiry Date:

   Limit of Cover:

5. Evaluation Observer's Manual

Australian Pome Fruit Improvement Program

Observers Manual 2007

APFIP LTD

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Australia.

Version 4

Contents

Introduction

This manual is for use Apfip Ltd evaluation progamn observers, custodians and evaluation groups only. It serves as a guide to assist in the recording of pome fruit evaluation data. It must be stressed that it is only a guide and should be used as such. This guide does not cover all of the possible problems or enquiries an observer may encounter during the recording of data. It serves to address the most commonly found issues that will arise during the season of observations. Observers who are experiencing difficulty with any aspect of the evaluation program should contact the Evaluation Coordinator as listed on *Contacts Page* - page 23

The Australian Pome Fruit Improvement Program Ltd. Evaluation Program is supported by Horticulture Australia Ltd. R&D funds.

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Timing of Observations

One of each form only; for every variety/rootstock combination.

1. Pre harvest (QF 08a): Post Flowering. (Flowering and thinning dates must be noted).
2. Harvest (QF 08b): At or very close to, harvest.
3. Post Harvest Fresh (QF 08c): At harvest, or after a maximum of 2 wks storage.
4. Post Harvest Stored (QF 08d): After a minimum of two months (air) storage.
5. Tasting (QF08e): To be used concurrently with QF 08c and/or QF 08b.
6. Dormant tree (QF 08f): At anytime during dormancy four years after planting and for that year only.

Frequency of Observations:

- Twice a week during harvest (QF08b) and flowering (QF 08a). (Preferably on Tuesday and Friday.)
- Start taking samples early for testing to ensure optimal estimation of harvest time.
- For storage observations (QF 08c & QF 08d), within the required storage parameters.
- For dormancy (QF 08f), observations to be taken when it suits observer.

Timing of Camera Use:

1. At Harvest: 1 shot of whole tree and 1 shot of fruit on tree. (Choose representative example of that variety.)(*Refer to procedures and "Use of digital cameras")
2. During tasting or storage observations: 1 shot of 4 fruit showing all sides and 1shot of 2 cut fruit. (*)
3. At dormancy 1 shot of full tree to compliment Dormant tree observations (QF 08f).

Sampling of Fruit:

- Take random representative samples from each variety/rootstock combination.
- For *Harvest* (QF 08b) samples use multiple fruits from each variety to take maturity, pressure test, and brix readings.
- For both *Post Harvest* (QF 08c & QF 08d) observations, take at least ten fruits from each variety for each storage observation period (20 fruits in total).
- For *Tasting* (QF 08e) use "Tasting Panel Procedures" (see page 8) for instructions.
- Use plastic bags to separate samples from each variety. These bags should be clearly labeled. (4.5kg or 5 kg bags are ideal)
- Use boxes, cartons, or plastic crates to store samples keeping bags from individual varieties separated.

If more hard copy observations forms are required, you are welcome to photocopy those you already have or alternatively ask the Evaluation Coordinator to supply you with replacements. Forms may be regularly updated so don't copy too many at a time. You are encouraged to practice with the hard copy forms, but remember all information is strictly confidential.

Note: Overall Fruit Quality Ratings on forms QF 08b and QF 08e are for the rating of fruit on-tree unpicked as seen (appearance and external qualities only, in QF 08b), and for picked fruit as tasted (appearance, taste, and internal qualities, in QF 08e). Basic internal quality assessments should be taken during QF 08d (Storage) observations.

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Form use

- Fill observation data into hard copy form. Forms can be posted, faxed, or emailed to the Evaluation Manager. If lodging forms on-line go to page 17 (preferred method).
- Please fill out forms in their correct order, and fill in *all* the relevant data fields.
- Use black pen, and print clearly. No pencil please.
- Please keep comments relevant to the form being used e.g. don't comment about fruit colour on a storage form, keep that to the harvest form.
- Remember that length/width measurements for fruit are actually diameters (not circumference) measured with a sizing ring or callipers. (Use latitude and longitude positions around a fruit).
- Keep measures of length/width weight to single millimetres and grams and not fractions of.
- Measurements for TSS%, Brix, and pressure can be recorded to a single decimal point, i.e. 15.9%brix or 8.5kg/m3 pressure.
- There is no need to average multiple measurements when a form is lodged on-line.
- Fill in the harvest date on forms that require it and don't forget to tag samples with the harvest date – this is very important.
- See section *Assessing Maturity* (Page 7) for assistance completing forms QF08b and QF 08c.

Tips and Examples for completing data fields.

QF08a Pre harvest/Flowering

- Some estimation required for % bloom dates, as it is impractical to visit site often enough to get complete accuracy on those dates.
- Use comparison with other varieties in the site for observations of fields such as *Flower density* and *List other varieties simultaneously at Full Bloom.*
- Thinning should be done early and to 5 fruitlets per sq. cm trunk cross sectional area (within 6 weeks after full bloom). Refer to page 22 - *Calculations for Trunk Cross-Section Area and Crop Loading.*
- Noting of dormancy spray use very important, but only relevant in a couple of sites.
- Noting of temperature during flowering is only a general observation.
- Importantly, the flowering form needs to be completed after at least two observations. One at actual flowering, and two to complete the form at thinning to observe crop loading.

QF08b On tree/Harvest

- See page 7 and 8 (*Assessing Maturity*) for testing procedures before using this form.
- *Tree Habit*
  - Upright – i.e. Cripps Pink
  - Spreading – i.e. Jonathan
  - Weeping – i.e. Fuji
- *Tree Vigour* - esimate based on observations of other trees in the block or on the surrounding orchards.
- *Fruiting Habit*
  - Tip Bearing – i.e. Fuji and Cripps Red (young trees)
  - Lateral Bearer – i.e. Hi Early
  - Semi spur – i.e. Royal Gala
  - Spur type – i.e. Starkrimson
- *Leaf Colour*- taken from the topside of the leaf.
- *Leaf Size* – measure from where the leaf margin begins to the leaf tip.
- *Crop Yield* – How does the tree's crop level compare to those trees around it, and in relation to its overall size?
- Fruit shape guides are exaggerated and fruit are rarely that easy to judge – use your best estimate.
- *Fruit Shapes APPLES* (Refer to diagram - page12)
  - Flat – i.e. Akane
  - Flat-round – i.e. Bonza
  - Round – i.e. Fuji
  - Round-conical – i.e. Braeburn
  - Conical – i.e. Golden Delicious
  - Long-conical – i.e. Red Chief
  - Round-oblong – i.e. Cripps Pink
  - Square-oblong – i.e. Mutsu/Crispin
- *Fruit Shapes PEARS* (Refer to diagram - page12)
  - Turbinate – i.e. Winter Cole
  - Ovate-pyriform – i.e. Williams
  - Oblong-ovate-pyriform – i.e. Packhams

TIP: To find numbered trees in site easier, tag every tenth tree in row with surveyors flagging tape.

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  - Globular-acute-pyriform – i.e. Buerre Hardy
  - Oblovate-pyriform – i.e. Josephine
  - Rounded-oblong-pyriform – i.e. Red D'Anjou
  - Oblong-pyriform – i.e. Conference
  - Elongated-oblong-pyriform – i.e. Bosc
  - Flat-round – i.e. Hosui
  - Round-oblate – i.e. Nijisseiki
- *Fruit shape symmetry* – is the fruit symmetrical?
- *Fruit shape consistency* – is there fruit shape consistency all over the tree?
- *Colour types*
  - Solid – i.e. Granny Smith
  - Blushed – types that are mainly solid colour with just a blush of red, pink or orange – i.e. Blushing Gold – also commonly applies to pear types.
  - Bicoloured – i.e. Braeburn
- *Over colour* – the colours listed may not match exactly what you see so use multiple choices, but please only two.
- *% Over colour* – here take an estimate of the % of the fruit surface covered by the above over colour. (At arm's length, front-on you can see 60% of the fruit surface.)
- *Background colour* – can't always be seen easily, look hard around the calyx end of the fruit. Even solid coloured apples/ pears have background colour.
- *Colour Intensity* - How does the intensity of the fruit's colour compare to other varieties in the block? Does it stand out?
- *Skin Bloom* – Is the dusty blue, grey, or white coating of wax on an apple. This can be much more prominent on some varieties.
- *Russet Area and Russet Density* - Where russet occurs and how thick it's covering on the fruit surface?
- *Russet position*
  - The difference between stem bowl and stem end russet is that the former is restricted to the stem bowl, while the latter is generalized around the stem end - i.e. Jonathan.
  - *Lenticel* russet is very small and restricted to close to and around the lenticel spots.
  - *Cheeks* of the apple are the widest part usually on the upper third of the fruit.
  - *General* russet is when the russet covers all or close to all parts of the fruit.
  - *Complete* russet usually applies to pears – i.e. Buerre Bosc. This can sometimes apply to apples.
- *Sunburn* – Is the fruit sunburned or just tanned or not affected?
- *Tendency to crack* - Some varieties of apples particularly tend to crack end the stem end when very ripe or in adverse climatic conditions. The variety Gala is notorious for this.
- *Uniform ripening* - Is the fruit ripening evenly on the tree? Look at the top, bottom, and inside of the tree. Are there significant differences in ripeness?
- *Pre-harvest drop*
  - Look under the tree. Are there fruit on the ground with no visible damage (either insect or birds), and have there been no major wind events?
- *Stem Breakout* – This is the tendency of the stem (usually on apples and nashi) to break out during picking. (A fragile fruit/ stem join is an undesirable characteristic).
- *Multiple picks* – your best estimate how many colour/maturity picks this variety would require - i.e. Growers usually pick for 60% colour when picking for colour on bicoloured varieties. (This must also be based on the assumption that when you're doing the assessment, you're assessing the first pick fruit).

QF08c Post Harvest Fresh

- Best done indoors on a counter or desk (washable).
- See page 7 and 8 (*Assessing Maturity*) for some of the testing procedures used on this form.
- *Starch Score* – Use a sharp knife to cut cleanly through the centre of the apple straight through core so seeds are chopped. Use the calxy end half of the fruit to take starch readings. Dip fruit-half in iodine solution for several seconds and wait 15 seconds to test.
- *Fruit Pressure* - Use a firm surface as backing when using the penetrometer.

Always use the non-blush side when taking readings.

- *TSS % / Degrees Brix* - Always use the non-blush side for readings.
- *Shelf Life* – another estimate, based on experience.
- *Open Calyx* – An open calyx is generally considered an undesirable characteristic.
- Core size is relative to comparisons with other apple varieties. See diagram - pg 8.

QF08d Post harvest Stored

- Best done indoors on a counter or desk (washable).
- *Juiciness, Sweetness, Crispness, and Texture* – use representative of sample - some tasting required, mainly noting deterioration during storage.
- *Quality rating* – based on observations at harvest time, and the experience gained.

QF08e Off tree/Tasting

- *Skin Thickness* Examples:
  - Thin – Golden
  - Medium – Red Delicious
  - Thick – Lady Williams
- *Skin Toughness* - How tough is the skin to chew?
- *Flavour* Examples:
  - Aromatic – Cox's, some pears.
  - Balanced – Jonagold
  - Bitter – Some cider apples
  - Bland – Some spur type reds
  - Chalky/Dry - Some spur type reds
  - Effervescent - Cripps Red
  - Florally – Splendour
  - Rich/Sweet – Fuji
  - Spicy – Hosui Asian pear
  - Sprightly – Cripps Pink
  - Starchy – under ripe Red Del.
  - Tart/Acid – Granny Smith
  - Off – aldehyde taste
- *Sweetness* - What is your first impression of the sweetness of the variety you're sampling.
- *Acid:Sugar ratio* – Acid and sugar negate each other so we are limited to 5 choices.
- *Flesh Texture* Examples:
  - Soft – Overripe Jonathan
  - Fine/Melting – Jonagold
  - Medium – Red Delicious
  - Course – Some scab-free cultivars (Prima, Priscilla)
  - Grainy/gritty – Many pears
  - Rubbery – Wilted after storage
- *Flesh cripness* – How crisp or crunchy is it?
- *Estimated ripeness* – Given your tasting, do you rate the fruit as properly ripe?
- *Overall Fruit Eating Quality Rating* - Based on all the above quality parameters, how would you rate this variety?

QF 08f Dormant Tree Observations

Careful note: Dormant forms are to be lodged only when trees reach their fourth year from planting and for that year only.

On each variety/rootstock combination select ten average one year terminal shoots (not watershoots) and measure length from the point of that year's growth initiation. Also measure shoot diameter by using vernier callipers (or equivalent), at a point approx. 10mm up from the same initial growth point. Be careful to measure diameter on a clear piece of stem, not where a bud node has swelled the stem. The "Dormant Tree" form should be lodged for the end of a season, not the beginning, i.e. A dormant tree form filled in August 2002 would be lodged against the 2001-2002 season not the 2002-2003 season.

- *Estimated tree vigour*- Considering the rootstock and site, your best estimate.
- *Estimated tree health* – Consider all the parameters for tree health.
- *Tree growth character* – Allow for some pruning or training methods and compare to other varieties in the block. Refer to diagram - page 13.
- *Canopy volume* – Compare to other varieties in the block.
- *Fruit bud development* – Compare to other varieties in the block. Refer to diagram - page 12.
- *Position of fruit buds* – Multiple choice. Refer to diagram - page 12.
- *Rootstock effect* – Do you consider the rootstock to be having an effect on growth, considering the age of tree and the same variety on other stocks?

QF09 Pest, disease, and disorder list for pome fruit.

- This is a guide to be used for identifying problems in a site.
- Refer to page 20.
- Make note of all pests etc. by using QF09. All online forms have a popup and check boxes for QF09 problems.

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Assessing maturity:

A guide for Observers.

The following is a guide to help assist Observers select fruit that is at the right stage of maturity for the APFIP Ltd. Evaluation Program use.

Observers must be able estimate optimum harvest well before picking fruit. In addition, there are different optimum maturity levels for the same cultivars, depending on intended use and storage life desired.

Harvesting too early results in fruit that is off-flavour or lacking flavour, poorly coloured, small, and subject to bitter pit and storage scald. Leaving fruit on the tree too long results in softer fruit, the potential development of watercore, and a shorter storage life.

Early tree training, annual pruning, proper fertilisation, and sound pest management can greatly affect tree vigour and, thus, fruit condition. Light crops, crops from extended bloom periods, or crops with high nitrogen levels may differ markedly in maturity date and subsequent storage potential. Each cultivar or strain should be evaluated separately for its maturity and storage potential.

Within the list of maturity indices (starch, firmness, juice sugar and acid content, seed colour, flesh colour, presence of watercore, background colour. All these indicators are relatively easily measured.

Of all the indicators, background colour, starch content, and firmness are the most important factors in guiding harvest timing. They are correlated to some extent with sugar content, acidity, flavour, aroma, texture and potential storage life.

Fruit with low starch readings of 1 on an index of 1–6 are still immature and will lack flavour and sugar content. They will have a desirable firmness, but the flavour aspect will overshadow this. In general, a combination of the presence of background colour, starch conversion of 25–35 percent, and firmness above 6.8kg will qualify for a good storage candidate. For immediate consumption, the presence of background colour, starches in the range of 4.5–6, sugar content above 13%, and firmness readings greater than 6kg should meet expectations.

Collect a representative sample of fruit, before doing any measurements. Trees should be typical of that variety/ rootstock combination and ideally have a uniform crop load and be of uniform vigour. Begin sampling approximately 4 to 5 weeks before normal harvest is anticipated. Sample four fruits from the periphery of each tree (recognizing that this represents the most mature fruit on the tree) and select fruit that is free of any visible insect injury or disease damage. Fruit temperature can affect certain test results; therefore, measurements of the samples' maturity should be performed within 2 hours of harvest.

Days after full bloom (DAFB)

DAFB should be used as a general reference to indicate when fruit might mature. There may be a 5- to 20-day spread between the average harvest date and the optimum harvest date for a particular cultivar. Since full bloom may vary from year to year, record full bloom (*Form QF 08a*) by cultivar each spring. Estimated days from full bloom to harvest for some cultivars are listed in below. These dates should be used as general guides.

Fruit Background Colour

The ground colour of green or partly coloured varieties is determined by the concentrations of green pigment, chlorophyll and yellow pigments, the carotenoids. As fruit matures the chlorophyll degrades revealing the carotenoids present in the skin. The change can be measured with colour meters and by comparison with colour cards.

As most Red Delicious strains are too highly coloured, ground colour cannot be assessed. On Granny Smith, Golden Delicious, Mutsu and standard Jonathan, ground colour change can be assessed visually, but a significant change may only be noticeable when fruit are too mature for long-term storage.

As with other parameters used for maturity assessment, ground colour is influenced to some degree by environmental conditions, independent of maturity. Ground colour may be greener at optimum harvest on trees with more leaves per fruit and where the fruit nitrogen status is high.

See attached colour chart.

Fruit firmness

Fruit firmness can be measured with either an Effigi fruit tester or a Magness-Taylor pressure tester. Both work on the principle that fruit flesh becomes softer as it matures. Many factors, including watercore and fruit size, can affect firmness readings. The presence of watercore will give higher readings that are inaccurate. Therefore, discard firmness measurements of apples that have watercore. Large apples are usually softer than smaller ones, so for firmness measurements try to choose apples of a relatively uniform diameter and that are representative of the fruit on the tree/s.

The most critical feature of firmness testing is the speed with which you apply force to the plunger. The proper speed is about 2 seconds as you insert the plunger into the fruit. Applying pressure too fast is probably the most common way of getting a false reading.

For apples, use the 11mm tip supplied with the pressure tester and penetrate to a depth of 7.9 mm as marked on the plunger. Test each apple on both the blush side and the non-blush side, and then average both readings. For pears use the 8mm tip (supplied with tester).

Percent soluble solids (or sugar levels)

As fruit matures, starch is converted to sugars. To measure the percentage of sugar in a solution, a refractometer is used. The refractometer measures

degrees Brix which is equivalent to the percentage of soluble solids. As fruit matures, refractometer readings increase, indicating fruit maturity is progressing. Fruit from trees with a heavy crop will have lower readings than fruit from trees with a light crop under similar growing conditions. Sugar content will be higher in years of reduced moisture availability, high temperatures, and high sunlight. As with firmness, refractometer readings will also vary by fruit position within the tree and nutritional status. Fruits located in exposed areas, where considerable photosynthesis is taking place, have higher soluble solids. Fruits heavily shaded and located inside the tree or on weak spurs have the lowest soluble level of fruit on that tree.

Select four apples of typical size from the tree. Do not use excessively blemished fruit. Cut piece from the top half of the un-blushed or least coloured side of the fruit.

Measurements are made by squeezing a small amount of juice from the fruit onto the prism of the refractometer. Hold the instrument up to the light and read the percentage of soluble solids by looking through the lens. After each sample of juice, rinse the prism face off and wipe with a soft tissue to avoid contamination among samples. One can calibrate refractometers by zeroing with distilled water and at 10 percent with a solution of 10 grams of sucrose dissolved in 90 grams of water.

Acidity

As fruit mature, their acid content decreases. Malic acid is the major acid in apple juice, and it plays a major role in the flavour attribute. Granny Smith apples have developed a well-known image based on their tart or acidic flavour. Some apple varieties, such as Pink Lady, attain acid values as high as 1.4–1.5% in juice. There are no guidelines for maturity based on acid level. The amount of acid present is related to the variety and maturity stage. A drop in acid level is an indicator of advancing maturity.

Starch levels

Stage of maturity can also be assessed by performing the starch-iodine test to track starch disappearance. Applying an iodine solution to the cut surface of fruit stains the starch a blue black. The iodine solution can be made by dissolving 10 grams of iodine crystals and 25 grams of potassium iodide in 1 liter of water. The pattern of starch disappearance is specific for each variety. Delicious loses its starch in a fairly even ring called Concentric Type Pattern, while Golden Delicious shows an uneven pattern called Radial Type.

Examples of Concentric Type apple varieties:

- Braeburn
- Fuji

Examples of Radial Type apple varieties:

- Gala
- Granny Smith
- Cripps Red
- Cripps Pink

Fruit used for firmness testing and soluble solids readings can also be used for the starch-iodine test. Cut the fruit at right angles to the core, approximately halfway from the stem to the calyx end. Apply the iodine solution to the cut surface, drain away any excess, and rate the fruit after 2 minutes. The reaction of iodine and starch is temperature-dependent. Under cold conditions, the reaction will take longer. An external heating source will speed up the reaction in cold environments. Avoid contact and be cautious when mixing and applying iodine solution.

A commonly used rating system and the one used by APFIP Limited is a scale of 1 to 6, as follows:

1. Full starch (all blue-black)
2. Clear of stain in seed cavity and halfway to vascular area
3. Clear through the area including vascular bundles
4. Half of flesh clear
5. Starch just under skin
6. Free of starch (no stain)

a Generic Starch-Iodine Index chart that is an excellent picture guide for making starch index determinations. See attached charts: Pages 10 and 11.

Seed colour.

Seed colour can also be used in a general way to determine maturity. Cut the fruit in half and rate the seed colour. An totally unripe fruit will have pale green or white seeds. As the fruit matures the seeds progressively get more colour (brown or tan) starting with the tips. Following the browning of the seed tips the colour spreads to cover the entire seed surface. A totally ripe fruit will have very dark brown or nearly black seeds.

This test is best used for determining maturity on early-maturing varieties.

Fruit texture

Texture can be evaluated by a simple taste test. If, as you chew the fruit, the flesh tends to wad up or seem cottony, the apple has not reached an ideal stage for harvest. This is a subjective test and probably no two people will always agree.

Remember, harvesting fruit at its optimum maturity requires skill and experience. Do not rely on just one maturity test, but try to use several different tests each year.

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Common chart used to rate background colour of apples:

PLATE 1

Apples picked at this stage are immature, sour, and of poor flavour. They are comparatively free from storage disorders, but wilt badly in store.

PLATE 2

Apples picked at this stage are slightly acid, of good flavour, and do not usually develop soft scald and breakdown in cool store.

Preferred background colour
for evaluation should be in this range.

PLATE 3

Apples picked at this stage are sweet, and of very good flavour, but are susceptible to soft scald and breakdown.

Apples picked at this time will have limited long-term storage potential.

PLATE 4

Apples picked at this stage are over-mature and become soft and mealy comparatively rapidly in cool store.

Please note: Colours not completely accurate to varieties and must be used only as a general guide.

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Starch Patterns - Concentric Type

Score 1.1 Almost entire surface stained blue-black.

Score 1.7 Staining absent from the core.

The starch-iodine rating scale (concentric type) for use on Red Delicious, Braeburn and Fuji apples.

Score 2.0 Staining absent from the core and about 10% of the cortex.

Score 3.0 Staining absent from the core and the cortex to the vascular bundles.

Preferred score for Evaluation

Score 4.0 Staining absent from the core and 50% of the cortex.

Score 5.0 Staining absent from 90% of the cortex and mainly evident near the skin.

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Starch Patterns - Radial Type

The starch-iodine rating scale (radial type) for use on Jonathan, Gala, Golden Delicious, Pink Lady, Sundowner, Granny Smith and Lady Williams apples.

Score 1. Entire surface stained blue-black.

Score 2. Staining absent from the core.

Score 3. Staining absent from the core and about 10% of the cortex.

Score 4. Staining absent from the core and 50% of the cortex.

Preferred Score for Evaluation

Score 4.5. Staining absent from the core and about 70% of the cortex.

Score 5. Staining absent from 90% of the cortex and mainly evident near the skin

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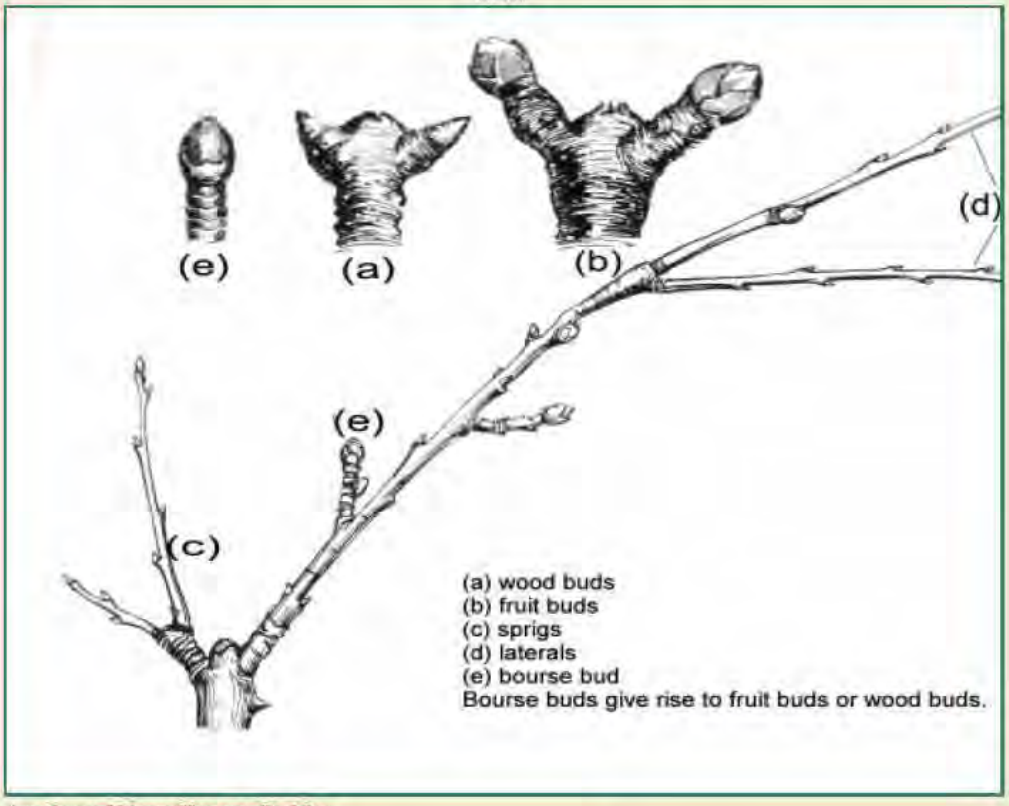
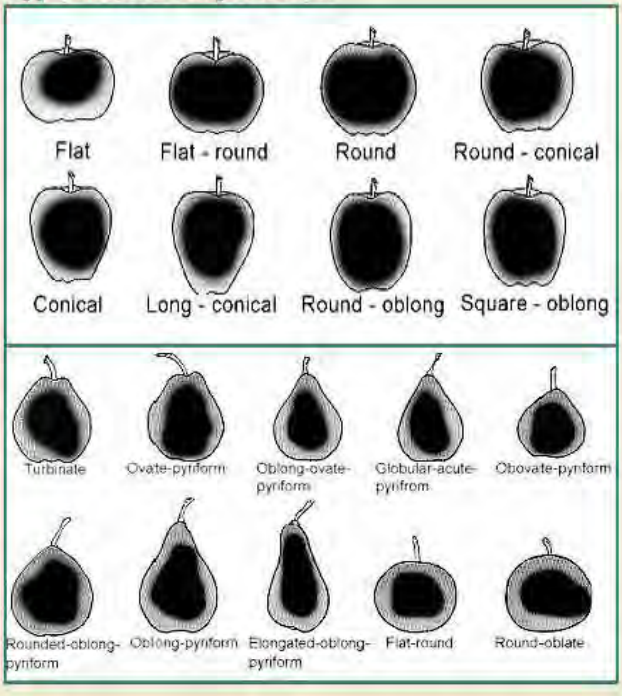
Diagram of fruit bud development and position on an apple tree. Pears have a similar bud growth and fruiting habit



Apple and Pear Shapes Guides



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Guide to identifying Tree Shapes.

Strongly Upright

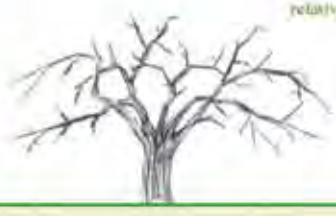
Upright-Spreading

Spreading

Wide-Spreading

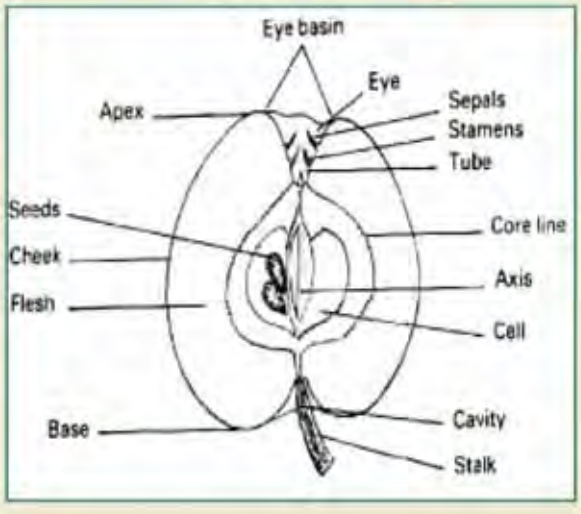
Also make note of a tree's relative vigour as either weak, moderate, strong, very strong. Vigour is easier to measure on young trees, but always involves growth of 1-year old shoots and overall relative size.

Weeping



Compact/Spur-Type

To the right is a diagram and descriptions of the internal features of the apple. Pears share the same features.



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Tasting Panel Procedures

Evaluation Groups to conduct three "Tasting Panel" meetings a year.
Meeting One : To cover early season varieties, with minimal storage ability.
Meeting Two : To cover mid-season varieties with a minimum of six weeks storage.
Meeting Three : To cover late season varieties with a minimum of six weeks storage.

Meeting Format

- "Tasting Panel" should comprise at least five members to provide a variety of tasters, and also allow for a majority in assessment decisions.
- "Tasting Panel" should endeavour to be objective and unanimous in their assessments.
- " Tasting Panel" can comprise of Evaluation Group, their wives or children, or even interested members of the public. This can provide a wide variety of tastes and preferences.
- "Tasting Panel" should remember that there are individual taste preferences, and only a unanimous or compromise assessment will be acceptable.
- Tasting should follow a similar form to a blind wine tasting.
- "Tasting Panel" should not be swayed by individual bias toward certain taste preferences, and to be objective.
- Each variety ready for taste testing should be pressure tested, brix tested, then sliced into portions before tasting with sufficient set aside to observe flesh browning character.
- Each variety to be placed on a white plastic or paper plate with its variety code clearly marked.
- Time should be allowed for; thorough assessment of each variety (regardless of initial reactions); and to carefully fill out assessment form.
- A break from tasting between varieties is suggested, with a palate cleanser such as cheese or a dry cracker biscuit consumed.
- The varieties, Gala (for early season), Fuji (for mid-season), and Pink Lady (for late season), should be used as controls for tasting. These should be consumed two or three times randomly through each tasting session. It must be kept in mind that the tasted varieties will be quite different than the control varieties, and not be judged against them. The control varieties are only used to provide the "Tasting Panel" with a well-known and established variety as grounding.
- The Evaluation Group is encouraged to make each tasting session a social event and enjoy the occasion.

Overall fruit quality ratings should be graded according to a combination of all categories within the assessment form and the unanimous "Tasting Panel" judgments.

Individual "Tasting Panel" Member Requirements

- (Some) Members should have a good working knowledge of pomefruit varieties, flavour characteristics, and apple physiology.
- (Some) Members must be able to distinguish differences in flavour, texture, and general eating characteristics of pomefruit varieties.
- Members must be able to make their assessments within the parameters of the observation forms.
- At least one of the members should be proficient in the use of testing equipment associated with the evaluation.
- Members must keep in mind that the information gained from these assessments will only be as good as it is reported. Members must make objective and unbiased assessments.
- Members shall relay information on ripeness of a particular variety to the Regional Custodian or Group Evaluator, if adjustments are needed for the next harvest. (This to ensure best possible assessments).

APFIP LTD. will endeavour to train at least some of the members of each "Tasting Panel" in the specific requirements of the Evaluation. It will be then the responsibility of those trained members to convey the requirements to other members within each group.

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Use of Digital Cameras

BEFORE USE, REFER TO APFIP LTD. QUALITY PROCEDURE #4.9/09: EVALUATION and *Timing of Observations* and *Form Use* on pages 3 & 4.

USE OF DIGITAL CAMERAS FOR EVALUATION.

- Each evaluation group will receive one digital camera, one Ni-MH/Ni-cad battery charger and 4 Ni-MH batteries, and one compact Flash card.
- **Thoroughly** read camera User's Guide that you receive from APFIP LTD. with the camera.

BATTERIES

- Digital cameras are heavy users of batteries, ensure you have adequate charged batteries ready for a photography session.
- Good quality AA alkaline batteries can be used to substitute Ni-MH if necessary. Rechargeable alkaline batteries can be used, but must not be recharged in the supplied Ni-MH/Ni-cad charger. (This could be dangerous).
- Ni-MH batteries need not be drained down before recharging.

SETTINGS

- Set camera to "**Best**" picture quality.
- Set camera to "**High**" resolution.
- Border/Templates, set to "**Off**".
- Set camera to "**Centre -Weighted**" metering.
- Set camera to "**Auto ISO**".
- Set Sharpness to "**Standard**".
- Set Flash to "**Fill**".
- Set White Balance to "**Auto**".
- Set Exposure Lock to "**Off**".
- Set Date and Time on your camera. **DD/MM/YY**. (This is important)
- Turn on the Date Stamp setting.
- Set camera to "**JPEG**" image file type.
- Set camera to "**Quickview**".
- Memory card/Flashcard will not need to be formatted.

TAKING PICTURES

- Make sure that the camera is set for close up when taking required four fruit sample.
- Use the preview screen for *preview* and the viewfinder for taking shots.
- Fill the frame, when capturing shots!!
- Use flash for all close up shots.
- Keep camera steady while shooting, and ensure strap, fingers or lens cap don't get into frame.
- Place sample fruits against blue or green background for close ups (not white), for best contrast. Also, use a blue or green I.D. card for shots (not white), and black felt marker for writing. (See sample shots)
- Cut fruit shots should include four pieces, one fruit cut in half longitudinal, and one cut in half latitudinal. (See sample shots)
- Do not polish, or improve appearance of sample fruits in any way.
- Use large block print on I.D. cards, with AP code number clearly legible.
- Ensure that I.D. card is visible and easily read. (Use clothes peg to clip I.D. in tree)
- Use flash for all tree shots, for fill in lighting.
- When photographing trees, stand no more than 2 meters away from the subject, using the wide-angle setting.
- Tree shots should include good view of tree shape, foliage, and crop load. (See sample shots)
- The cameras flash card is 64 megabytes. This should allow for 105 high-resolution shots. (Resolution is measured in pixels, and the camera has two settings for this; standard and high.)
- Camera is not to be used for any purpose other than evaluation, unless specified by APFIP LTD.
- Keep written records of shots taken for your use and future use by the Evaluation Coordinator.

REVIEWING PICTURES

- The **Quickview** function will allow you to review each shot immediately after it is taken.
- Mistakes and bad shots can be, and should be instantly deleted using the Trash Can function, and retaken.

SENDING PHOTOGRAPHS TO APFIP LTD.

- Flash cards are to be sent in a padded envelope to APFIP LTD. Evaluation Manager once full, or at the end of each season, which ever comes first. A replacement flash card will be immediately issued.
- Camera is supplied with software, so pictures can be sent via email, but this is not the preferred method as picture files can be very large and pictures cannot be deleted until notification of receipt from the Evaluation Manager.
- Extra flash cards will be issued to all evaluation groups, upon request.

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Example of Required Photographs

Dormant tree shot. Note: blackboard showing site, tree code, rootstock and date.

Full tree shot. Note: blackboard showing site, tree code, rootstock and date.

Below: **Fruit on tree in closeup.** Note: blackboard showing site, tree code, rootstock and date.

Examples of required photographs

External view of the fruit on the template

Internal view of fruit on template post starch test

Internal view of fruit on template

All of the following images on this page are shown on the *QF48 Photo Template*, which is available from Apfip or direct from Observer login *https://evaluation.apfip.com.au/secure/observer/procedures.cfm* and can be photocopied. When photocopying this template use a low contrast paper, such as mid-green or blue, as plain white paper will reflect back too much of the camera flash. Please note that in each case the Apfip code, Site no, date and rootstsock are all marked clearly with black felt-tip pen. Also note that the fruit is shown from all sides in the first shot and cut in half both ways (*latitudinally and longitudinally*) in the second. The starch shot shows as clearly as possible the results of the initial starch test, which should be done with Form *QF 08c Post Harvest Fresh. Observations.*

Australian Pome Fruit Improvement Program

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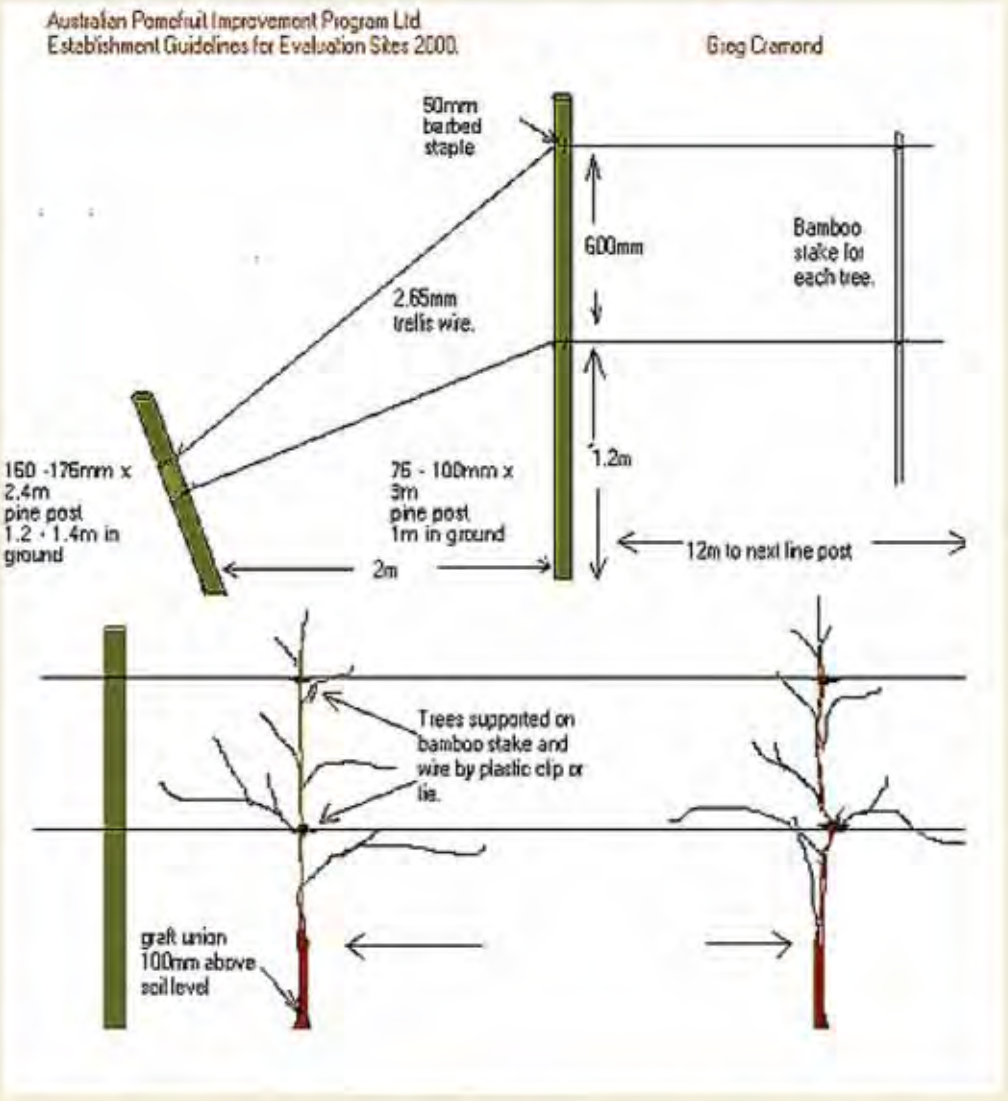

Apfip requires a trellis for all regional evaluation sites. Whilst Apfip requires a trellis, the example depicted above is only that and not a required system. Due to regional preferences in trellis design, the trellis system chosen by a custodian can be negotiated but ultimately must be approved by the Apfip Evaluation Coordinator. In the interests of consistancy the Evaluation Coordinator will prefer a single row vertical-axe style trellis system as shown above. The trellis must be robust enough to support the weight of the fruit. The trellis also needs to be high enough so as to support the top of the tree, a leader must be retained. The distance between the line posts shall be no more than 9 meters. Installation of the trellis early in the life of the orchard is very important for development of the young trees. Trees will show better growth at the early stages if they are supported and as Apfip requires fruit for evaluation early we want to give the trees every possible advantage. It should also be noted that Apfip regularly uses dwarfing rootstocks and these can show marked weakness at the rootstock/scion union and hence require support from planting.

APFIP recommends the use of straw mulch from planting whenever M9 is used in warmer sites.

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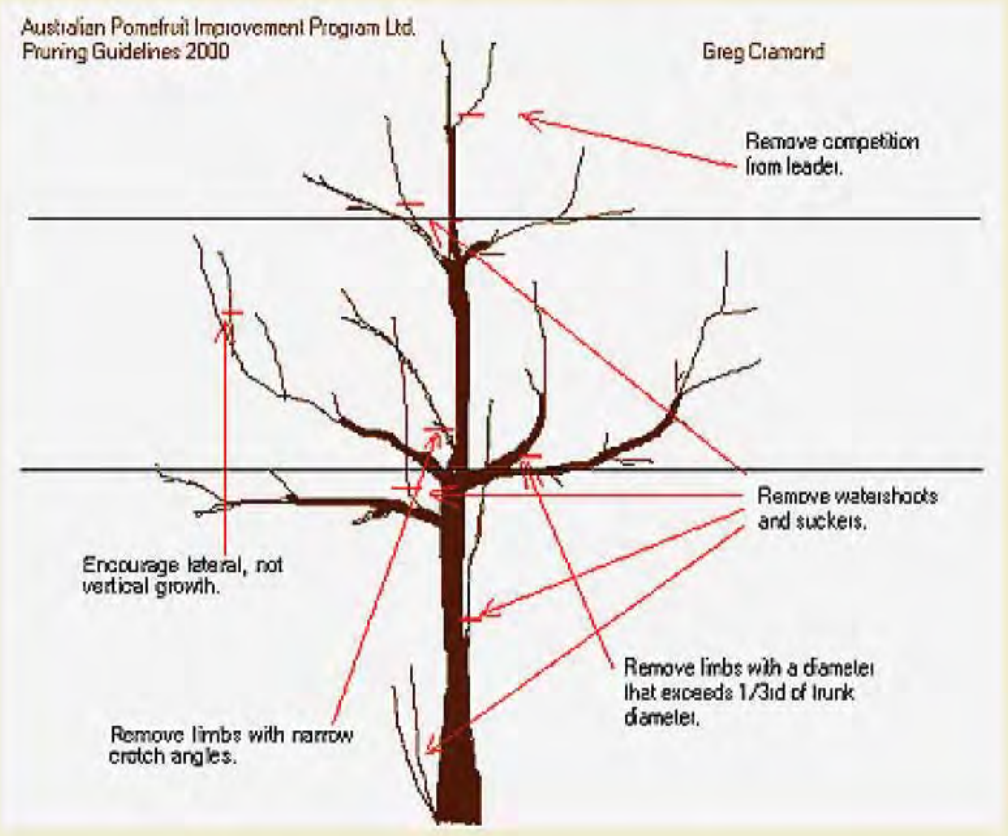

Apfip trees for evaluation purposes are only used for tree growth and fruit characteristic data comparisons only. For this reason, pruning is kept to a minimum to give consistancy in comparisons and to achieve early cropping. Consistancy of comparisons for tree growth can only be achieved by minimal pruning within a site and in all sites. It is requested that custodians refrain from doing "experimental" and "regional" pruning methods on the trees. Maintenance pruning as shown above should be done for tree health hygiene, clearance and access purposes. Allow plenty of ground clearance for limbs. No tipping, heading cuts or bench cuts should be used on these trees. Stub cuts for limb renewal are OK, but only where a troublesome limb needs to be replaced. As these trees are to be in sites for no more than seven years there is no necessity for custodians to treat the pruning with a "long-term" view.

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Copy of *QF 09 - Pest, disease and disorder list for pome fruit*

Diseases:
Alternaria Blotch
Black Spot / Apple Scab
Black Spot / Pear Scab
Powdery Mildew
Bacterial Canker (Pears only)
Silver Leaf
Anthracnose Rots
- Bitter rot
- Target spot
- Ripe spot

Sooty Blotch
Fly Speck

Viruses:
Apple Mosaic
Apple Stem Grooving
Apple Stem Pitting
Green Crinkle
Rubbery Wood
Apple Chlorotic Leaf Spot
Stony Pit (Pears only)

Root diseases:
Phytophthora
Wood Rot
Crown Gall
Armillaria
White Root Rot

Disorders:
Bitter Pit
Cork Spot (Pears only)
Blackend (Pears only)
Pinkeye (Pears only)
Boron Deficiency

Storage Disorders:
Wet core rot
Dry core rot
Water core
Alternaria Rot
Grey Mould
Blue Mould
Mucor Rot
Yeast Rot
Superficial scald
Friction discolouration

Others:
Hail damage
Frost damage
Rootstock incompatibility and/or burr knotting
Rootstock suckering

Insect Pests:
Apple Dimpling Bug
Ash White Fly
Budworms – Heliothis spp.
Canary Fly
Codling Moth
Light Brown Apple Moth
Oriental Fruit Moth
Painted Apple Moth
Loopers
- Apple Looper
- Twig Looper
- Pome Looper

Fruit Fly
- Mediterranean
- Queensland

Woolly Aphid
Pear root Aphid
Long-Tailed Mealy Bug
Wingless Grasshoppers
San Jose Scale
Oyster Shell Scale
Thrips
- Plague Thrips
- Western Flower Thrips

Pear and Cherry Slug
Weevils
- Garden Weevil
- Fuller's Rose Weevil
- Fruit Tree Root Weevil

Fruit Tree Pinhole Borer
Earwigs

Other Invertebrate Pests:
Bryobia Mite
European Red Mite
Two-spotted Mite
Rust Mite
Pear Leaf Blister Mite
Snails
- Garden Snail
- Mediterranean Snail

Vertebrate Pests:
Rabbits
Hares
Deer
Kangaroos
Wombats
Birds

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Weather Stations

Western Electronic Design of Loxton, SA, manufactures the APFIP weather stations.
Enquiries about settings and use can be directed to the Evaluation Coordinator or alternatively towards:
Mike Western at:
Ph: 08 85824446
Fax: 08 85824446
Mob: 0418 891975
Email: wedesign@riverland.net.au

Weather Station users instructions:

- Please carefully read the users manual and familiarise yourself with the unit before installing the software or siting the unit.
- The weather station is to be mounted on a 25mm (1") galvanised water pipe that has been set in concrete. Mount the unit about 1.5 meters off the ground.
- The station should be sited in the site or as near as practicable to the site, where it is most convenient for the custodian in regards to tractor use etc. It is best not to put the station where it will get the full force of sprays or spraying, and clear of the influence of trees. You will note that the unit is attached to a bracket. This allows easy removal and the unit can be brought back to your office for easy download. Of course if you have a laptop, you could take that into the field for your downloads.
- Install the software on your computer. It is compatible with most systems running Windows.
- The weather station requires 6 AA alkaline batteries and these should be somewhere in the box. These should be good for about a year and there is a warning light to alert to low battery strength. APFIP requires that observers replace the batteries as a matter of maintenance once a year regardless of their charge status. Cost of batteries can be charged to APFIP using the usual expense claim form. See note below regarding batteries.
- Make a "site" on your software. The name of this site should match the name of the site at the top of the APFIP site plan for your particular site.
- Read additional site set up instructions on page 1 of the manual and set station for 30-minute data storage interval.
- The information downloads should take place at least bi-monthly. It is important that this is done as the units can only store two months of information. The information download is in ASCII format and can be readily emailed. Until further notice weather data should be emailed to greg@ apfip.com.au It is asked that observers keep their site weather records as well, and back upped on a separate floppy disc (supplied).
- Please fill in and return the "Receipt of APFIP Equipment" form to sender ASAP after receipt of this package.

Important note: When changing batteries in a unit remember that the machine will need it's time and date reset. Upon replacement of batteries the unit will automatically go to default settings (12am, 1st/January 1980) and an operator needs to override this.

Important note 2: After 2006 most all the weather stations were upgraded to remote download. This means that the weather stations are now monitored and downloaded from the office of the Evaluation Coordinator and Observers no longer have to do any monitoring other than what is mentioned below:

- Weather stations should be checked for any exterior damage to the unit or the solar panel and modem aerial.
- The raingauge of the unit should be checked regularly especially the debris filter located in the rain catchment funnel. This filter should be cleaned regularly to ensure good rainfull readings. See fig 1.
- The air-slats at the bottom of the unit, which protect the temp and RH meters need to be cleared of dust and cobwebs from time to time. (A old paint brush is good for this job.) See Fig 2.

Fig 1. Fig 2.

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Thinning and Crop Loading

Calculations for Trunk Cross-section Area and Crop Loading

FIRST: MEASURE TRUNK DIAMETER WITH CALIPERS. (Remember 1inch = 2.5cm)

SECOND: CALCULATE CIRCUMFERENCE OF TRUNK. (Multiply diameter by 3 - Roughly©)(3.14285714 - exactly®)

THIRD: USING CHART CROSS REFERENCE TRUNK CIRCUMFERENCE TO ASCERTAIN TRUNK CROSS-SECTION AREA, AND TOTAL TREE CROP LOAD WITHIN APFIP LTD. S REQUIRED 5 FRUITLETS PER TCM2.

Always take trunk measurement immediately below first fruiting twirl (scaffold) of branches.

Table showing the the required amount fruitlets per tree for APFIP Ltd evaluation purposes.

Trunk Diameter - "/cm	Fruitlets per tree
1" / 2.5cm	24
1.5" / 3.75cm	55
2" / 5cm	98
2.5" / 6.25cm	152
3" / 7.5cm	220

Thinning tip: To make counting of fruitlets easier - quarter the tree visually and divide no. of fruit required by 4. Once no. of fruit for the quarter is established thin all small, misshapen, larger bunches, etc. until that required number is reached.

Crop Loading - Pears

For the purposes of Apfip Ltd trials crop loading of pears can be monitored to ensure correct thinning of varieties. For this purpose we use the variety *Williams* as our "control". Using the chart below and bearing in mind that we desire to see pears in the 70 - 80 mm range, we can see that ideally we would require fruitlets to be 38 - 41mm at 60 days after full bloom (see in red). Fruitlets under this size would need to be further thinned out (or off) to achieve the size range required.

STANDARD GROWTH CURVE - Williams (Barlett) Pears

Projected fruit diameter at harvest - Millimetres

	57	60	63	66	70	73	76	79
DAFB	Present fruit diameter - Millimetres							
60	27	30	32	34	36	38	41	44
65	30	33	35	37	39	41	44	47
70	33	35	38	40	42	44	47	51
75	35	38	40	43	45	47	51	54
80	37	40	43	45	48	51	54	57
85	40	43	46	48	51	54	57	60
90	42	45	48	51	54	57	60	63
100	47	50	53	56	59	62	65	68
110	52	55	58	61	64	67	70	73
120	56	59	62	65	68	71	74	77
125	57	60	63	66	70	73	76	79

The growth rate of Williams pear fruit is fairly constant through out the season. Measuring the diameter of the fruit at specified times could indicate the probable size later in the season.

To use this table in thinning, decide on the minimum harvest size desired. Follow that size down to the number of days it is past full bloom. Any fruit smaller than the size shown in the table is not likely to reach the desired minimum size. Thinning some of these off will help the rest to size properly

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On-line Lodgement of forms

If lodging forms on-line go straight to this address https://evaluation.apfip.com.au/ and add this link to *Favourites*.

All observers need a username and password to access on-line forms, these can be obtained by contacting the site administrator.

In accessing the database an observer will note their functions are limited to the site or sites that the y collect data from. Navigation within the site is simple and easy to follow. If an observer finds a fault i.e. a tree not matching it's listing in the database, they should immediately contact the site administrator. (Listed opposite)

Forms

- Fill out forms in the hard copy in the field before lodging on-line.
- Observers should keep hard copies on hand for reference and comparison when filling in further forms of a given variety/ rootstock combination, i.e. assessing deterioration of fruit after two months of storage.
- Lodge as soon as possible after observance and make sure the date of the observance, not lodgement is noted.
- On-line forms mirror hard copy forms, except there is many pull down boxes on-line which speeds up lodgement considerably.
- Please note: when entering data on-line many of the fields need the use of *not applicable* and *none* into entered boxes to successfully complete lodgement. This is for when a person may be entering data from a pear variety and the field usually applies to apple varieties.
- Forms successfully lodged, but with incorrect or incomplete data can be modified by clicking on *Modify* next to the form in point and data fields corrected or completed.

Extra observers manuals can be downloaded or read on the web at:
https://evaluation.apfip.com.au (password protected)
and follow links to *Forms and Procedures*.

Contact List

Australian Pome Fruit Improvement Program Ltd.

On-line now at : www.apfip.com

Evaluation data to: https://evaluation.apfip.com.au
Secure site access to approved users only!

For all evaluation enquiries and online database enquiries contact:

Gregory Cramond

Evaluation Coordinator

Australian Pome Fruit Improvement Program Ltd.
1, Cramond Road
Basket Range SA 5138
Australia.
Ph: 08 83901344 Intl: 618 83901344
Fax: 08 83900033 Intl: 618 83900033
Email: greg@apfip.com.au

For all administration enquiries contact:

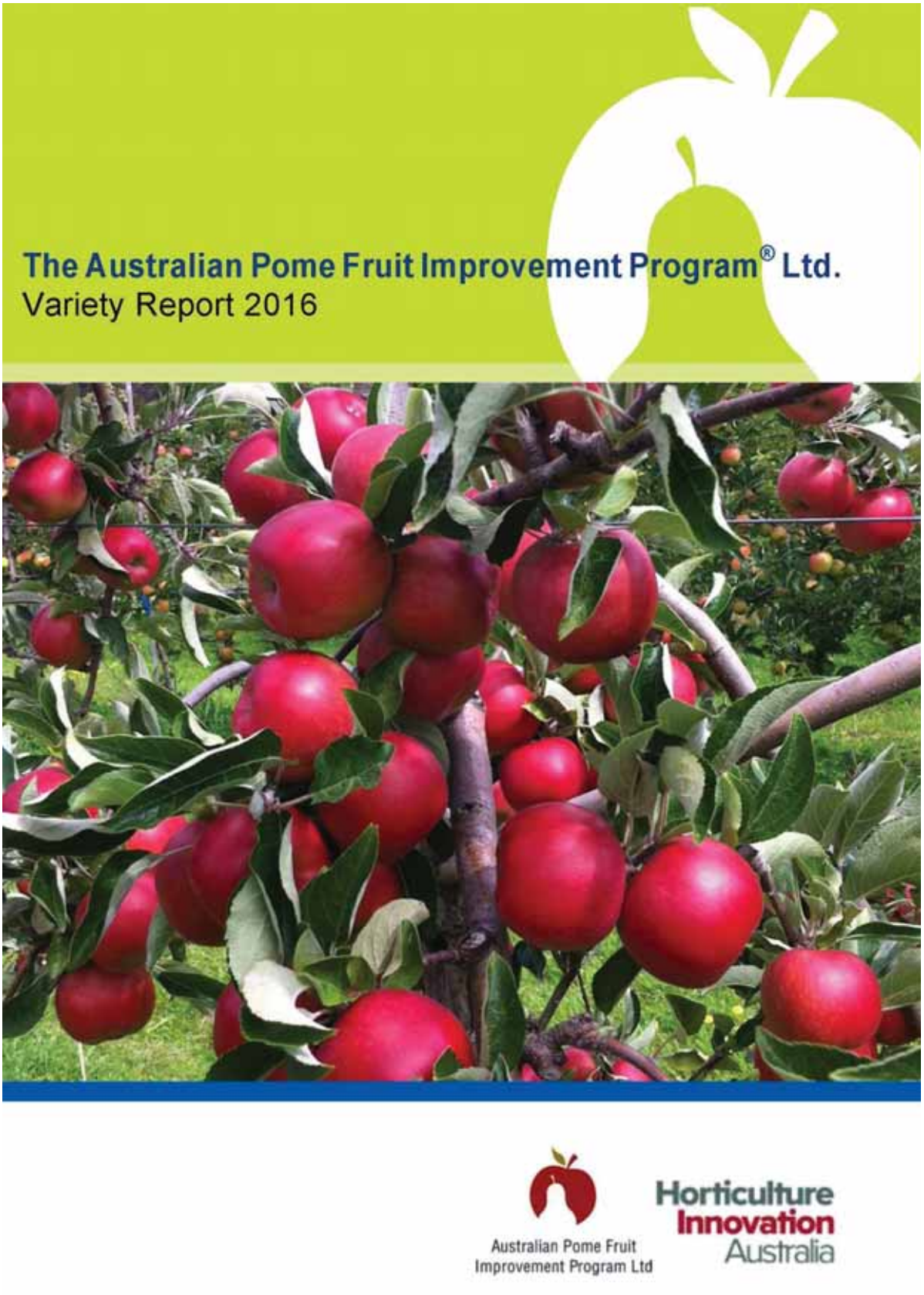
Garry Langford

General Manager / Company Secretary

Australian Pome Fruit Improvement Program Ltd.
35, Fourteen Turn Creek Road
Grove, Tasmania 7109
Australia.
Ph: 03 62664344 Intl: 613 62664344
Fax: 03 62664023 Intl: 613 62664023
Email: garry@apfip.com.au

Australian Pome Fruit Improvement Program

6. 2016 Variety Report



APFIP – your industry-owned company

The Australian Pome Fruit Improvement Program Ltd. (APFIP) was established in 1997 by the Australian Apple and Pear Growers Association Inc. – which became Apple and Pear Australia Limited (APAL) in 2002 – for the benefit of the Australian apple and pear (pome fruit) industry.

APFIP

APFIP is a not-for-profit company with a board of nine directors who work in the pome fruit industry. Apple and pear growers fund APFIP along with a matching contribution from the Australian government via Horticulture Innovation Australia Limited (HIA). The main functions of APFIP are to:

- Provide certification of propagating material varieties and rootstocks to help remove unknown viruses from plant germplasm
- Provide independent evaluation of new varieties
- Represent the apple industry in Australian Quarantine and Inspection service (AQIS) matters that relate to quarantine and the introduction of new varieties

APFIP operates an independent, secure and efficient evaluation network, which encompasses most major temperate tree fruit growing regions of Australia. Effective evaluation is vital as it gives growers information they require to make balanced decisions on variety choice for their operations.

Facilitate and promote efficient quarantine services
Pome fruit budwood is classified as high security because of the risk of introducing fire blight and other exotic pests and diseases. This material can only enter the country through an AQIS accredited government operated post-entry quarantine station. A review of the pome fruit budwood protocols was completed in February 2002, which led to changes to the quarantine testing protocols resulting in a reduction of the post-entry quarantine time from four years to 15 months.

Multiplication of selected budwood and rootstocks
APFIP has established a new repository for it's certified varieties and rootstocks near Cambridge in southern Tasmania. The site has access to ample water supplies and is isolated from the pome fruit production areas. It has an ideal climate for the trueness to type assessment of heat-treated varieties and rootstocks. APFIP will again offer rootstocks for sale, in limited quantities and fully certified.

Horticulture Innovation Australia

This project was facilitated by HIA in partnership with APAL and is funded by the apple and pear levy. The Australian Government provides matching funding for HIA's RSD activities.

APFIP's registered certification trademark.

Certification

APFIP has introduced its own certification system for fruit tree propagating material, which will operate under this certification trademark.

The benefits of certified propagating material were highlighted in a research project completed in Australia in 1988 (L. Penrose et al) that compared the performance of three apple cultivars (Jonathon, Richared Delicious & Granny Smith) propagated from using budwood and rootstocks from a virus-tested scheme with trees propagated from sources known to be latently infected with viruses and a mycoplasma. Over a three-season period:

- Virus tested Jonathon trees out yielded infected trees by 56 per cent.
- Virus tested Richared Delicious out yielded infected trees by 40 per cent.
- Virus tested Granny Smith out yielded infected trees by 41 per cent.

Certified nursery trees will meet three criteria; they test negative for viruses (apple stem grooving, apple stem pitting, apple mosaic and apple chlorotic leaf spot), are true to type and satisfy minimum nursery tree standards.

Certified nursery trees are available through the following APFIP trademark licensees:

Olea Nursery	Mitcheldean Rd, WEST MANJIMUP, WA 6258	08 9772 1207
Tahune Fields Nursery	Lucaston Rd, LUCASTON, Tas 7109	03 6266 4474
Tangara Nursery	40 Pages Rd, GROVE, Tas 7109	03 6266 4364
Hansen Orchards	Bevin Road, GROVE Tas. 7109	03 6264 0200
Mount View Orchards	272 Old Tumbarumba Rd, BATLOW, NSW 2730	02 6949 1765
Balhannah Nurseries	Coldstore Rd, LENSWOOD, SA 5240	08 8389 8600
Topstock Investments	Main Ridge, RED HILL, Sth Vic 3929	03 5989 6257
Little Tree Company	201 Hays Rd, KATUNGA, Vic 3640	0458 648 390
Galgate Nursery	388 Myrtle Ford/Stanley Rd, Stanley, Vic 3747	0418 335 928

Visit the APFIP website: www.apfip.com.au

This Variety Report briefly outlines some of the apple and pear variety reports available to fruit growers on the APFIP website. The website is also a valuable source of information of varieties, industry news and information as well as certification information on rootstocks, budwood and nursery trees. A sample Weather Report appears on page 17, which shows the data available for most pome fruit growing regions of Australia.

Variety reports – an explanation

Variety data reports

There are many characteristics that need to be considered when assessing the potential of a new variety. These include:

- Flowering and cropping characteristics
- Tree characteristics
- Fruit appearance
- Eating qualities
- Storage ability
- Disease rating

The variety testing work of APFIP draws together the results of observations on all these characteristics and presents them in reports generated in real time on the APFIP website – a small sample of reports are listed in this document.

A variety data report can be reviewed individually, collectively, or in combinations of rootstock, growing region and season.

Reports can be generated in the following formats:

Variety character reports:
These show comprehensive groupings of variety characters on an individual page. Variety character reports show the sum of all data taken from a site/sites and presented against listed data fields.

Summary reports:
These show an abbreviated selection of data taken from the sum of all data from a site/sites. Not all data fields are represented. Data fields listed on summary reports will show either:

- Percentages based on all data against check boxes.
- Percentages based on high, average, low lodgements of data in data fields.

Highest, average and lowest ratings that show the highest and lowest measured data and an average of all data. Numbers in brackets ( ) listed next to data field listings are the total number of data inputs in this particular data field.

Disease rating report:
These reports summarise data on pest/disease/disorders observed on a variety. They do not necessarily show a variety's propensity to disease, unless consistent and frequent observations are made, which are supported by spray/weather records.

Media report:
Including some graphs and photos these reports give a "snap-shot" outline (not comprehensive) of a variety's performance.

Photographs:
An array of variety photographs in high, medium or low resolution can be selected for viewing or downloading.

Definitions of some selected data fields:
Some fields are best estimated based on an observer's experience i.e. shelf life, overall eating rating, overall fruit appearance. For these, observers are given training to try to get consistency, but these are still subjective measures. Observers follow strict procedures and inspection based on forms completed for appropriate growth/maturity periods and complete all data fields.

Measurements:
Both fruit length and width are diameter measurements in millimetres where a fruit is measured longitudinally and latitudinally respectively. Fruit pressure is measured by a penetrometer in kg/m3 – an 8mm tip for pears, and an 11mm tip for apples. Total Soluble Solids (%) is measured in degrees brix by a refractometer. One-year shoot diameter is measured 10mm from initial point of one-year growth. Average tray count is based upon the Australian Standard 12kg tray pack carton. Gram weights for fruit packed in a 12kg carton are the same for an 18kg carton. The carton tray count conversion table is shown below:

12kg 3-layer Tray-Pack carton count size	Minimum gram weight	18kg 3-layer Tray-Pack carton count size
45	250	60
53	225	70
60	200	80
68	180	90
75	163	100
83	150	110
90	120	165
108	105	160

Important notes:
These reports are live and are updated daily, so data will change regularly. Low numbers of data entries per field may reduce the accuracy of reports and skew percentages. Sample size must be large enough to build a reasonable variety profile. APFIP reports cannot be edited by unauthorised persons and can only be published in an unedited format. All APFIP variety reports are the result of at least three years (seasons) of data collection.

Variety reports are available on the following varieties at www.apfip.com.au:

Apples: Caudle, Fiero, Fuji Naga Fu2&6, Gala T F & Royal, Golden Delicious, Cripps Pink, Rubinstar, Sunrise, Nova, Svatava, Topaz, Sansa, Myra, Snyder and Crimson Snow.

Pears: Bittura Precoce Morettini, Eldorado, Howell, Rogue Red and Red Clapps.

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

Variety reports – how to read them

Report type

The evaluation database produces areport based on the following criteria:

- Variety
- Rootstock
- Region
- Season

Fruit size

Average fruit size and weight is calculated from the data recorded for the selection criteria. Average tray count is based upon the Australian standard 12kg tray pack carton. Gram weights for fruit packed in a 12kg carton are the same for an 18kg carton. A carton tray count conversion table is listed on page three of this report.

Total Soluble Solids (TSS) and fruit pressure

Testing is done postharvest using a refractometer to determine degrees brix. The fruit is also pressure resistance tested at this time using a penetrometer (11mm for apples, 8mm for pears). These data fields are displayed with average and highest and lowest values.

Tree growth characteristics
Tree vigour

Tree vigour characteristics are expressed as a percentage of records made against the available data fields, which are:

- Weak
- Medium
- Strong
- Very Strong

In this example all records (100%) rated growth as strong.

Flowering and cropping

The graphs show the median date of full bloom and the earliest and latest bloom dates recorded. Date of harvest is shown similarly.

(x axis = month, y axis = day of the month)

Tree growth characteristics
Tree habit

Tree habit characteristics are expressed as a percentage of records made against the available data fields, which are:

- Strongly upright
- Upright
- Spreading
- Weeping

In this example all records (100%) rated habit as upright.

Fruit eating qualities

Data collectors and tasting panels assess eating qualities according to flavour, juiciness, sweetness, crispness and texture (fruit flesh). The report records the two highest percentages of each characteristic.

In the example below for flavour "rich" was recorded in all records (100 per cent), but "bland" was also recorded on 33 per cent of samples.

In the data fields for juiciness, "medium" (moderately juicy) was rated in 17 per cent of records and "juicy" in 67 per cent of records.

Sweetness, crispness and texture follow the same pattern.

Colours within the graph represent different characteristics and highlight percentage records.

Fruit appearance
Over colour / Background colour

Shown as a percentage records taken with appropriate colour displayed. Multiple colours may be displayed showing alternative data fields.

Fruit appearance
Fruit shape

The graphic shows the fruit shape, which represents highest percentage of records taken for this variety.

Photographs

Each report has three photo views, these are:

- Fruit internal
- Fruit on template
- Fruit on tree

These photos show the latest shots taken within the selection criteria.

Variety report – F11-82/ANP-118

Variety report: Media report

Variety: F11-82/ANP-118
Rootstock: Quince A
Region (site): 1 – Mooroopna North
Elevation: 187 M
Lat/Long: 36° 18' / 145° 36'
Season: 2010-2011
Report date: 20/04/2015 10:50

Average fruit width: 60.1mm
Average fruit length: 60.9mm
Average fruit weight: 165.5g
Average tray count: 75
**standard three layer 12kg carton*

TSS% (post harvest) (10)
10.3 Low
11.0 Average
11.9 High

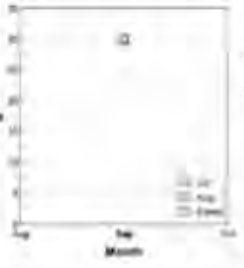
Pressure (post harvest) (10)
kg/m3
5.1 Low
5.5 Average
5.8 High

TREE GROWTH CHARACTERISTICS

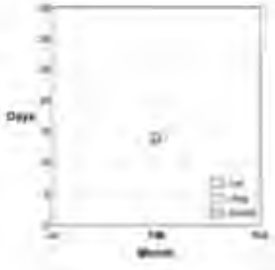
Tree vigour
Weak: 100%
Medium: 0%
Strong: 0%
Very strong: 0%

Tree habit
Spreading: 100%

Flowering and cropping



Full bloom date (1)
30 Sep Earliest
30 Sep Average
30 Sep Latest



Harvest date (1)
14 Feb Earliest
14 Feb Average
14 Feb Latest

FRUIT EATING QUALITIES

Flavour (1)
0% Aromatic
0% Balanced
0% Bitter
0% Bland
0% Chalky/dry
0% Floraly
0% Rich/sweet
0% Spicy
100% Sprightly
0% Starchy
0% Tart/acid
0% Tannic
0% Off
0% Effervescent

Acid : sugar ratio (1)
0% High acid : high sugar
0% High acid : mod sugar
0% High acid : low sugar
0% Mod acid : high sugar
100% Mod acid : mod sugar
0% Mod acid : low sugar
0% Low acid : high sugar
0% Low acid : mod sugar
0% Low acid : low sugar

Juiciness (1)
0% Dry
0% Medium
100% Juicy
0% Very juicy

Flesh texture (1)
0% Soft
0% Fine/melting
0% Breaking
100% Medium
0% Course
0% Grainy/gritty
0% Rubbery

Flesh crispiness (1)
0% Not crisp
0% Slightly crisp
100% Crisp
0% Very crisp

Flesh colour (1)
0% White
0% Cream
0% Yellow
100% Yellowish/green
0% Green

Sweetness (1)
0% Acid
100% Slightly sweet
0% Sweet
0% Very sweet

Skin thickness (1)
0% Thin
100% Medium
0% Thick

Continued...

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

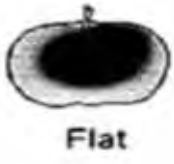
Variety report – F11-82/ANP-118

FRUIT APPEARANCE

Over colour

Background colour
0% Cream
0% Yellow
0% Yellowish/green
100% Green

Fruit shape
0% Flat



Flat

PHOTOGRAPHS

Internal photo

External photo

Fruit on tree photo

Variety report – C31-42/ANP-131

Variety report: Media report

Variety: C31-42/ANP-131
Rootstock: D6
Region (site): 1 – Mooroopna North
Elevation: 187 M
Lat/Long: 36° 18' / 145° 36'
Season: 2010-2011
Report date: 20/04/2015 10:53

Average fruit width: 59.4mm
Average fruit length: 67.5mm
Average fruit weight: 114.0g
Average tray count: 108
**standard three layer 12kg carton*

TSS% (post harvest) (10)
11.9 Low
12.3 Average
12.7 High

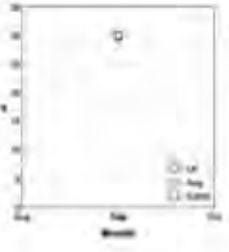
Pressure (post harvest) (10) kg/m3
4.0 Low
4.3 Average
4.6 High

TREE GROWTH CHARACTERISTICS

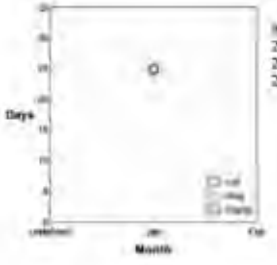
Tree vigour
Weak: 0%
Medium: 100%
Strong: 0%
Very strong: 0%

Tree habit
Spreading: 100%

Flowering and cropping



Full bloom date (1)
30 Sep Earliest
30 Sep Average
30 Sep Latest



Harvest date (1)
25 Jan Earliest
25 Jan Average
25 Jan Latest

FRUIT EATING QUALITIES

Flavour (1)
100% Aromatic
0% Balanced
0% Bitter
0% Bland
0% Chalky/dry
0% Floraliy
0% Rich/sweet
0% Spicy
0% Sprightly
0% Starchy
0% Tart/acid
0% Tannic
0% Off
0% Effervescent

Acid : sugar ratio (1)
0% High acid : high sugar
0% High acid : mod sugar
0% High acid : low sugar
0% Mod acid : high sugar
100% Mod acid : mod sugar
0% Mod acid : low sugar
0% Low acid : high sugar
0% Low acid : mod sugar
0% Low acid : low sugar

Juiciness (1)
0% Dry
0% Medium
0% Juicy
100% Very juicy

Flesh texture (1)
0% Soft
0% Fine/melting
0% Breaking
100% Medium
0% Course
0% Grainy/gritty
0% Rubbery

Flesh crispiness (1)
0% Not crisp
0% Slightly crisp
0% Crisp
100% Very crisp

Flesh colour (1)
100% White
0% Cream
0% Yellow
0% Yellowish/green
0% Green

Sweetness (1)
0% Acid
100% Slightly sweet
0% Sweet
0% Very sweet

Skin thickness (1)
100% Thin
0% Medium
0% Thick

Continued...

Australian Pome Fruit Improvement Program Ltd

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Variety report – C31-42/ANP-131

FRUIT APPEARANCE

Over colour

Background colour
0% Cream
0% Yellow
0% Yellowish/green
100% Green

Fruit shape
0% Flat

Flat

PHOTOGRAPHS

Internal photo

External photo

Fruit on tree photo

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

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Variety report – A160R02T017

Variety report: Media report

Variety: A160R02T017
Rootstock: M26
Region (site): 1 – Mooroopna North
Elevation: 187 M
Lat/Long: 36° 18' / 145° 36'
Season: 2011-2012
Report date: 20/04/2015 10:37

Average fruit width: 73.7mm
Average fruit length: 64.5mm
Average fruit weight: 175.2g
Average tray count: 75
**standard three layer 12kg carton*

TSS% (post harvest) (10)
13.2 Low
14.2 Average
14.9 High

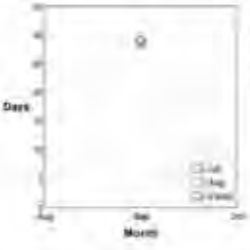
Pressure (post harvest) (10)
kg/m3
8.6 Low
9.5 Average
10.5 High

TREE GROWTH CHARACTERISTICS

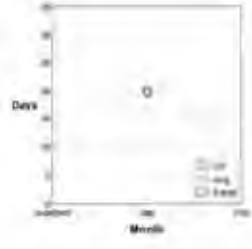
Tree vigour
Weak: 100%
Medium: 0%
Strong: 0%
Very strong: 0%

Tree habit
Spreading: 100%

Flowering and cropping



Full bloom date (1)
8 Oct Earliest
8 Oct Average
8 Oct Latest



Harvest date (1)
15 Feb Earliest
15 Feb Average
15 Feb Latest

FRUIT EATING QUALITIES

Flavour (1)
0% Aromatic
0% Balanced
0% Bitter
0% Bland
0% Chalky/dry
0% Florally
0% Rich/sweet
0% Spicy
100% Sprightly
0% Starchy
0% Tart/acid
0% Tannic
0% Off
0% Effervescent

Acid : sugar ratio (1)
0% High acid : high sugar
100% High acid : mod sugar
0% High acid : low sugar
0% Mod acid : high sugar
0% Mod acid : mod sugar
0% Mod acid : low sugar
0% Low acid : high sugar
0% Low acid : mod sugar
100% Low acid : low sugar

Juiciness (1)
0% Dry
0% Medium
100% Juicy
0% Very juicy

Flesh texture (1)
0% Soft
0% Fine/melting
0% Breaking
100% Medium
0% Course
0% Grainy/gritty
0% Rubbery

Flesh crispiness (1)
0% Not crisp
0% Slightly crisp
0% Crisp
100% Very crisp

Flesh colour (1)
0% White
100% Cream
0% Yellow
0% Yellowish/green
0% Green

Sweetness (1)
0% Acid
0% Slightly sweet
100% Sweet
0% Very sweet

Skin thickness (1)
100% Thin
0% Medium
0% Thick

Continued..

Australian Pome Fruit Improvement Program Ltd

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Variety report – A160R02T017

FRUIT APPEARANCE

Over colour

Background colour
0% Cream
0% Yellow
100% Yellow/green
0% Green

Fruit shape
100% Round

PHOTOGRAPHS

Internal photo

External photo

Fruit on tree photo

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

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Variety report – A160R02T017

Variety report: Media report

Variety: A160R02T017
Rootstock: M26
Region (site): 8 – Pozieres
Elevation: 932 M
Lat/Long: 28° 31' / 151° 52'
Season: 2011-2012
Report date: 20/04/2015 10:28

Average fruit width: 67.7mm
Average fruit length: 59.5mm
Average fruit weight: 143.4g
Average tray count: 90
**standard three layer 12kg carton*

TSS% (post harvest) (10)
14.4 Low
15.8 Average
16.7 High

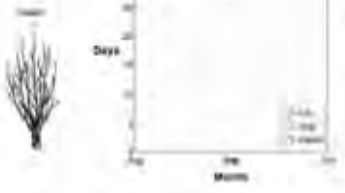
Pressure (post harvest) (10)
kg/in3
9.1 Low
10.3 Average
12.1 High

TREE GROWTH CHARACTERISTICS

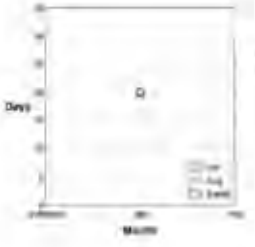
Tree vigour
Weak: 0%
Medium: 100%
Strong: 0%
Very strong: 0%

Tree habit
Upright: 100%

Flowering and cropping



Full bloom date (1)
29 Sep Earliest
29 Sep Average
29 Sep Latest



Harvest date (1)
20 Jan Earliest
20 Jan Average
20 Jan Latest

FRUIT EATING QUALITIES

Flavour (1)
0% Aromatic
100% Balanced
0% Bitter
0% Bland
0% Chalky/dry
0% Floraliy
0% Rich/sweet
0% Spicy
0% Sprightly
0% Starchy
0% Tart/acid
0% Tannic
0% Off
0% Effervescent

Acid : sugar ratio (1)
0% High acid : high sugar
0% High acid : mod sugar
0% High acid : low sugar
0% Mod acid : high sugar
100% Mod acid : mod sugar
0% Mod acid : low sugar
0% Low acid : high sugar
0% Low acid : mod sugar
0% Low acid : low sugar

Juiciness (1)
0% Dry
100% Medium
0% Juicy
0% Very juicy

Flesh texture (1)
0% Soft
0% Fine/melting
100% Breaking
0% Medium
0% Course
0% Grainy/gritty
0% Rubbery

Flesh crispiness (1)
0% Not crisp
0% Slightly crisp
100% Crisp
0% Very crisp

Flesh colour (1)
0% White
100% Cream
0% Yellow
0% Yellowish/green
0% Green

Sweetness (1)
0% Acid
100% Slightly sweet
0% Sweet
0% Very sweet

Skin thickness (1)
0% Thin
100% Medium
0% Thick

Continued...

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

Variety report – A160R02T017

FRUIT APPEARANCE

Over colour

Background colour
0% Cream
0% Yellow
100% Yellow/green
0% Green

Fruit shape
100% Flat-round

Flat - round

PHOTOGRAPHS

Internal photo

External photo

Fruit on tree photo

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

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Variety report – RS103-130 (Kalei)

Variety report: Media report

Variety: RS103-130
Rootstock: MM106
Region (site): 1 – Goulburn Valley
Elevation: 187 M
Lat/Long: 36° 18' / 145° 36'
Season: All
Report date: 13/03/2012 11:42

Average fruit width: 73.8mm
Average fruit length: 65.4mm
Average fruit weight: 187.4g
Average tray count: 68
**standard three layer 12kg carton*

TSS% (post harvest) (70)
12.0 Low
15.9 Average
19.6 High

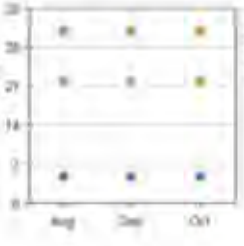
Pressure (post harvest) (70)
kg/m3
6.2 Low
9.8 Average
11.9 High

TREE GROWTH CHARACTERISTICS

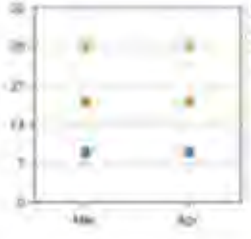
Tree vigour
Weak: 0%
Medium: 33%
Strong: 50%
Very strong: 17%

Tree habit
Spreading: 100%

Flowering and cropping



Full bloom date (3)
31 Aug Earliest
22 Sep Average
5 Oct Latest



Harvest date (6)
18 Mar Earliest
28 Mar Average
9 Apr Latest

FRUIT EATING QUALITIES

Flavour (6)
0% Aromatic
33% Balanced
0% Bitter
0% Bland
0% Chalky/dry
0% Floraliy
50% Rich/sweet
0% Spicy
17% Sprightly
17% Starchy
0% Tart/acid
0% Tannic
0% Off
0% Effervescent

Acid : sugar ratio (6)
17% High acid : high sugar
0% High acid : mod sugar
0% High acid : low sugar
0% Mod acid : high sugar
33% Mod acid : mod sugar
0% Mod acid : low sugar
0% Low acid : high sugar
17% Low acid : mod sugar
33% Low acid : low sugar

Juiciness (6)
0% Dry
50% Medium
33% Juicy
17% Very juicy

Flesh texture (6)
0% Soft
0% Fine/melting
0% Breaking
83% Medium
17% Course
0% Grainy/gritty
0% Rubbery

Flesh crispiness (6)
0% Not crisp
0% Slightly crisp
17% Crisp
83% Very crisp

Flesh colour (6)
0% White
33% Cream
17% Yellow
50% Yellowish/green
0% Green

Sweetness (6)
0% Acid
33% Slightly sweet
33% Sweet
33% Very sweet

Skin thickness (6)
17% Thin
67% Medium
17% Thick

Continued

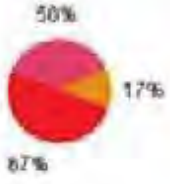
Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

Variety report – RS103-130 (Kalei)

FRUIT APPEARANCE

Over colour



Background colour
0% Cream
0% Yellow
33.3% Yellow/green
66.6% Green

Fruit shape
67% Round conical

Round - conical

PHOTOGRAPHS

Internal photo

External photo

Fruit on tree photo

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

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Variety report – Fiero® apple

Variety report: Media report

Variety: Fiero
Rootstock: M26
Region (site): 8 – Stanthorpe
Elevation: 932 M
Lat/Long: 28° 31' / 151° 52'
Season: All
Report date: 02/07/2016 12:38

Average fruit width: 79.7mm
Average fruit length: 65.9mm
Average fruit weight: 213.0g
Average tray count: 80
**standard three layer 12kg carton*

TSS% (post harvest) (10)
13.1 Low
14.4 Average
16.6 High

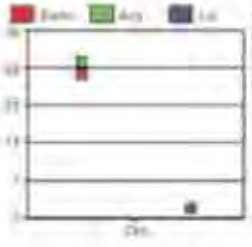
Pressure (post harvest) (10)
kg/m3
6.3 Low
7.4 Average
9.6 High

TREE GROWTH CHARACTERISTICS

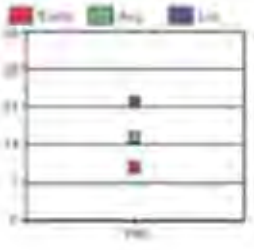
Tree vigour
Weak: 40%
Medium: 60%
Strong: 0%
Very strong: 0%

Tree habit
Upright: 100%

Flowering and cropping



Full bloom date (5)
27 Sep Earliest
29 Sep Average
02 Oct Latest



Harvest date (5)
10 Feb Earliest
15 Feb Average
22 Feb Latest

FRUIT EATING QUALITIES

Flavour (5)
0% Aromatic
50% Balanced
0% Bitter
0% Bland
0% Chalky/dry
0% Floraily
33% Rich/sweet
0% Spicy
17% Sprightly
0% Starchy
0% Tart/acid
0% Tannic
0% Off
17% Effervescent

Acid : sugar ratio (6)
0% High acid : high sugar
0% High acid : mod sugar
0% High acid : low sugar
17% Mod acid : high sugar
50% Mod acid : mod sugar
0% Mod acid : low sugar
17% Low acid : high sugar
17% Low acid : mod sugar
0% Low acid : low sugar

Juiciness (6)
0% Dry
17% Medium
67% Juicy
17% Very juicy

Flesh texture (6)
0% Soft
67% Fine/melting
17% Breaking
0% Medium
17% Course
0% Grainy/gritty
0% Rubbery

Flesh crispiness (6)
0% Not crisp
17% Slightly crisp
83% Crisp
0% Very crisp

Flesh colour (6)
33% White
33% Cream
33% Yellow
0% Yellowish/green
0% Green

Sweetness (6)
0% Acid
50% Slightly sweet
33% Sweet
17% Very sweet

Skin thickness (6)
33% Thin
67% Medium
0% Thick

Continued...

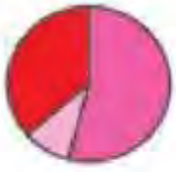
Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

Variety report – Fiero® apple

FRUIT APPEARANCE

Over colour



Background colour
20% Cream
0% Yellow
20% Yellow/green
0% Green

Fruit shape
40% Round

PHOTOGRAPHS

Internal photo

External photo

Fruit on tree photo

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

16

Weather station data

APFIP maintains a number of weather stations around Australia at its evaluation sites. Weather data is downloaded monthly, configured and reported in the Australian Fruitgrower Magazine.

APFIP is currently undergoing an upgrade of all its weather stations to new MEA stations that are live online and update every hour. APIFIP currently has five stations commissioned – Huon Valley in Tasmania, Orange in New South Wales, Manjimup in Western Australia, Lenswood in South Australia and Ardmona in Victoria. APFIP hopes to have another four stations installed over the coming 12 months.

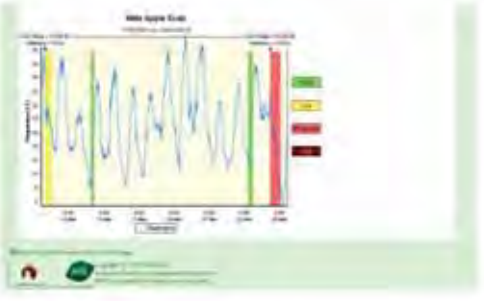
The data from these stations is available to all growers 24/7 via www.apfip.com.au and following the weather data link.

General data available:
Temperature, humidity, wind speed, rainfall, daylight hours.

Growing data:
Soils temperature, evaporation, leaf wetness, growing degree days, chill units, frost hours.

Graphs:
These are displayed for all data ranges as well as Mills apple scab.

For more information about these stations contact APFIP Evaluation Coordinator Mark Hankin on 0408 503 528 or mark@apfip.com.au.



Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

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Variety register and evaluation status

The following table shows the varieties that have been through the APFIP evaluation program and lists; the variety coding name, supplier, evaluation sites and the varieties are identified in the sites in which their evaluation has taken place.

Identification is shown as either purple or red dots indicating that the variety is inactive (purple) and has finished the required time frame or active (red/year of planting) the variety is still being evaluated in a pacific site.

The other columns indicate the current evaluation status of the variety.

Due to the confidential nature of agreements and contracts between APFIP and its suppliers, variety names cannot be displayed.

APFIP currently has 21 suppliers on its variety register consisting of private growers, Australian and international breeding programs.

• Inactive • Active/year planted • Current Status

Apples	APFIP evaluation areas, last updated 7/3/2016																			
	Huon Valley Geyerts	Tamar Valley Clatrospe	Goulburn Valley Boldrio	Goulburn Valley Turnbull	Yarra Valley Johns	Orange Perry	Orange NSW Station	Manjimup Cesanne	Manjimup RNRI Station	Lenswood Green	Lenswood Wheelsen	Batlow Wilson	Stanthorpe Rizzato	Stanthorpe Daff Station	APFIP REPOSITORY TAS	PEQ	General access	Eliminated	Supplier data only	Still being evaluated
A&B James SA										•		•	•		•				•	
Alan Casey NSW	•		•					•					•		•			•		
ANFIC NSW	•				•	•		•		•			•				•			
ANFIC NSW						•		•									•			
ANFIC NSW	•		•		•	•				•		•	•				•			
ANFIC NSW	•		•		•	•				•		•	•				•			
ANFIC NSW	•		•		•	•				•		•	•				•			
ANFIC NSW												•	•				•			
ANFIC NSW	•		•			•				•	11		8							•
ANFIC NSW	•		•		•	•				•	11	8	8							•
ANFIC NSW	•			11	•	•						8	8							•
ANFIC NSW	•		•	11	•	•				•	11	8	8							•
ANFIC NSW/Prevar	•																		•	
ANFIC NSW/Prevar	•																		•	
ANFIC NSW/Prevar	•		•		•	•				•		•	•						•	
ANFIC NSW/Prevar	•		•			•				•		•	•						•	
ANFIC NSW/Prevar	•		•			•		9		•		•	•							•
ANFIC NSW/Prevar	•																		•	
ANFIC NSW/Prevar					•	Split tree died due to poor quality														
ANFIC NSW/Prevar	•		•			•				•		•	•						•	
ANFIC NSW/Prevar	•		•			•				•	•		•						•	
ANFIC NSW/Prevar	•					•						8	8							•
ANFIC NSW/Prevar	•		•			•				•	11		8							•
ANFIC NSW/Prevar	•		•		•	•				•		•	•						•	
ANFIC NSW/Prevar	•		•		•	•				•	•	•	•						•	
ANFIC NSW/Prevar	8		•			•				•			•							•
ANFIC NSW/Prevar	•		•		•	•				•	11		8							•
ANFIC NSW/Prevar	•		•			•				•			•						•	
ANFIC NSW/Prevar	•			11	•	•							8							•

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

Variety register and evaluation status

Apples	APFIP evaluation areas, last updated 19/2/2015																			
	Huon Valley Calvert's	Tamar Valley Clatthorpe	Goulburn Valley Bolobio	Goulburn Valley Turnbull	Yarra Valley Johns	Orange Perry	Orange NSW Station	Manjimup Casuma	Manjimup MHRI Station	Lenswood Green	Lenswood Wheelhorn	Batlow Wilson	Stanthorpe Rizzato	Stanthorpe Daff Station	APFIP REPOSITORY TAS	IPEQ	General access	Eliminated	Supplier data only	Still being evaluated
ANFIC NSW/Prevar	•		•	•	•	•				•	•		•						•	
ANFIC NSW/Prevar	8		•	11	•	•				•	11	8	8							•
ANFIC NSW/Prevar	•		•			•				•	•		•						•	
ANFIC NSW/Prevar		15		15							15									
Prevar/APFIP															•					
Prevar/APFIP															•					
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APFIP Ltd	•		•		•	•				•			•				•			
Bill Shields NSW	•	14	•						14	•	11									•
C&O Nursery USA	•		•			•						•	•				•			
C&O Nursery USA	•		•			•		6				•	•		•		•			•
C&O Nursery USA	•		•			•		6				•	•		•		•			•
DAFWA	•		•		•	•				•			•		•				•	
DAFWA	•		•							•		•	•						•	
DAFWA	•		•							•		•	•						•	
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DAFWA	•		•							•		•	•					•		
DAFWA	•		•							•		6	•						•	

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

Variety register and evaluation status

Apples	APFIP evaluation areas, last updated 19/2/2015																			
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DAFWA	•		•							•	•	•	•					•		
DAFWA	•		•							•	•	•	•					•		
DAFWA	•		•							•		•	•					•		
DAFWA	12	13		12							12	12	12							•
DAFWA	12	13		12							12	12	12							•
DAFWA	13	13		13							13	13	13							•
Flemings Nursery	•																		•	
Grove Research TAS						•				•							•			
Grove Research TAS						•				•							•			
Grove Research TAS						•				•							•			
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Grove Research TAS															•					
Hort Research NZ	•																		•	
Hort Research NZ	•																		•	
Hort Research NZ	•																		•	
Hort Research NZ	•																		•	
Hort Research NZ	•																		•	
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Hort Research NZ	•																		•	
Hort Research NZ	•																		•	
Hort Research NZ	•																		•	
Mount View NSW												•					•			
Mount View NSW												•					•			
NIFTS Japan																		•		
NIFTS Japan															•					
Olea Nursery WA								•									•			

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

Variety register and evaluation status

Apples	APFIP evaluation areas, last updated 19/2/2015																			
	Huon Valley Calvert's	Tamar Valley Clathorpe	Goulburn Valley Bolobio	Goulburn Valley Turnbull	Yarra Valley Johns	Orange Perry	Orange NSW Station	Manjimup Casuarina	Manjimup MHRI Station	Lenswood Green	Lenswood Wheelahan	Batlow Wilson	Stanthorpe Rizzato	Stanthorpe Daff Station	APFIP REPOSITORY TAS	IPEQ	General access	Eliminated	Supplier data only	Still being evaluated
Olea Nursery WA								•									•			
Olea Nursery WA								•									•			
DAFF	•		•							•			•						•	
DAFF										•									•	
DAFF										•									•	
DAFF										•									•	
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DAFF	•		•							•			•						•	
DAFF	•		•							•			•						•	
DAFF	14	14		14			14		14		14	14		14						
DAFF	14	14		14			14		14		14	14		14						
DAFF	14	14		14			14		14		14	14		14						
DAFF	14	14		14			14		14		14	14		14						
Tahune Fields Nursery	•		•		•	•		•		•		•	•				•			
Tahune Fields Nursery			•		•	•				•		•	•				•			
Tangara Nursery TAS			•			•						•	•				•			
FENO	12	13		12		•	14		14		12	12	12		•					•
Better3fruits	12	13		12		•	14		14		12	12	12		•					•
Better3fruits	•	•		•		•				•		•	•					•		
Better3fruits	•			•		•				•		•	•					•		
Better3fruits	12	13		12		•	14		14			12	12		•					•
Better3fruits	13	13		13			14		14		13	13	13		•					
Better3fruits	14	14		14			14		14		14			14	•					
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Better3fruits																•		•		
Better3fruits															•					
Better3fruits															•					
University of Minnesota															•					

Australian Pome Fruit Improvement Program Ltd

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Variety register and evaluation status

Pears	APFIP evaluation areas, last updated 19/2/2015																			
	Huon Valley Calvert	Tamar Valley Clatworpe	Goulburn Valley Bolobio	Goulburn Valley Turnbull	Yarra Valley Johns	Orange Perry	Orange NSW Station	Manjimup Casuarina	Manjimup MHRI Station	Lenswood Green	Lenswood Wheinham	Batlow Wilson	Stanthorpe Rizzato	Stanthorpe Daff Station	APFIP REPOSITORY TAS	IPEQ	General access	Eliminated	Supplier data only	Still being evaluated
DPI Victoria			•		•					•								•		
DPI Victoria			•		•					•									•	
DPI Victoria			•		•					•									•	
DPI Victoria			•		•														•	
DPI Victoria			•		•					•									•	
DPI Victoria			•		•					•									•	
DPI Victoria			•		•					•									•	
DPI Victoria					•					•								•		
DPI Victoria					•					•									•	
DPI Victoria					•					•									•	
DPI Victoria					•					•									•	
DPI Victoria					•					•								•		
Coregeo				11					11		11	11								•
Coregeo				11					11		11	11								•
Coregeo				11					11		11	11								•
Coregeo				11					11		11	11								•
Coregeo				11					11		11	11								•
Coregeo				11					11		11	11								•
ANFIC NSW			•		•					•	•								•	
ANFIC NSW/Prevar	•																•			
ANFIC NSW/Prevar	•																•			
ANFIC NSW/Prevar	•																•			
ANFIC NSW/Prevar			•							•	11									•
ANFIC NSW/Prevar	•		•		•	•				•		•							•	
ANFIC NSW/Prevar			•		•			9		•	11	8	8							•
ANFIC NSW/Prevar			•		•			9		•	11	8	8							•
ANFIC NSW/Prevar			•		•			•		•	•	•	•						•	
ANFIC NSW/Prevar			•		•			•		•	•	•	•						•	
ANFIC NSW/Prevar			•	11	•			9		•										•
ANFIC NSW/Prevar			•		•			9		•	11	8	8							•
ANFIC NSW/Prevar			•		•			9		•	11	8	8							•
ANFIC NSW/Prevar			•							•	11									•
ANFIC NSW/Prevar			•																•	
ANFIC NSW/Prevar				11	•															•
DPI Victoria			•		•					•								•		

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

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Variety register and evaluation status

Pears	APFIP evaluation areas, last updated 19/2/2015																			
	Huon Valley Calvert's	Tamar Valley Clatthorpe	Goulburn Valley Bolobio	Goulburn Valley Turnbull	Yarra Valley Johns	Orange Perry	Orange NSW Station	Manjimup Casuarina	Manjimup MHRI Station	Lenswood Green	Lenswood Wheelton	Batlow Wilson	Stanthorpe Rizzato	Stanthorpe Daff Station	APFIP REPOSITORY TAS	IPEQ	General access	Eliminated	Supplier data only	Still being evaluated
APFIP Ltd															*					
APFIP Ltd																				
Hansen Orchards															*					
Hort Research/ANFIC	*																*			
Hort Research/ANFIC	*																*			
Hort Research/ANFIC	*																*			
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Hort Research/ANFIC	*		*		*	*				*		*							*	
Hort Research/ANFIC	*		*		*	*				*		*							*	
Hort Research/ANFIC	*		*		*	*				*		*							*	
Hort Research/ANFIC	*		*		*	*				*		*							*	
Hort Research/ANFIC	*		*		*	*				*		*							*	
Hort Research/ANFIC																				
Hort Research/ANFIC	*																		*	
Hort Research/ANFIC	*																		*	
ANFIC NSW/Prevar				15																*
ANFIC NSW/Prevar				15																*
ANFIC NSW/Prevar		15		15							15									*
ANFIC NSW/Prevar				15																*
ANFIC NSW/Prevar				15							15									*
ANFIC NSW/Prevar		*(D		15																*
Jill Cambell (OAI)															*					
Jill Cambell (OAI)															*					
Next Fruit Generation															*					
Next Fruit Generation															*					
Next Fruit Generation															*					
Nakturnbow																13				
Stoneville Research WA			*														*			
Stoneville Research WA			*														*			
Stoneville Research WA										*							*			
Stoneville Research WA			*							*							*			
Stoneville Research WA			*														*			

Annual Report 2015

APFIP provides three main services:

1. Independent evaluation of new varieties and rootstocks.
2. Certification of the health status of propagating material.
3. Representation of the industry in matters related to quarantine and the introduction of new varieties.

Evaluation

During the year, APFIP continued evaluation for 27 apple varieties and 21 pear varieties at eight national evaluation sites – one in each major growing region. It also conducted (under contract on a fee for service basis) evaluations at large scale commercial trial sites for APAL and Prevar Limited. During the year, one new apple varieties were received for evaluation out of quarantine.

In 2015, APFIP promoted new varieties to industry through variety showcases. A good example was at the Combined Horticulture Industry conference on the Gold Coast in June 2015. The variety showcase allowed growers to view varieties in the pipeline during the evaluation phase. APFIP staff were also involved in the promotion of new varieties to growers via APAL's Future Orchards® extension program.

Certification

In 2014/15, around 500,000 certified rootstocks were harvested by APFIP licensees. This represents approximately 80% of the annual industry requirement for apple rootstocks. During this period commercial sales of APFIP certified trees continued to be delivered to growers. Such trees use both certified rootstocks and certified scion material and meet other quality parameters. Because demand for certified trees is high, there is an increasing demand for sources of certified scion material for new and existing varieties. APFIP has now licensed nine nurseries to use the APFIP certification system. The whole certification system is underpinned by a database allowing trace back of rootstocks and scion material for which certification tags have been issued.

APFIP has an ongoing program of promoting the benefits of certified trees to the industry. This uses Certification Demonstration Sites planted in the main production regions, including to date in the Huon Valley, Tasmania; Stanthorpe, Queensland; and Lenswood, South Australia. Each site consists of a minimum of 500 trees, with 50 per cent of trees planted being from certified material and the other 50 per cent from non-certified material. All sites use 'Alvina Gala' on M26 rootstock. While the trees planted at these sites are only young, already significant increases in growth have been recorded for certified trees. APFIP also promotes the benefits of planting certified trees via articles in *Australian Fruitgrower magazine*.

An important component of APFIP's certification capability is the APFIP Repository in Tasmania. The Repository allows the planting of materials tested negative for specified viruses (including ex- quarantine material) and the initial bulking up of rootstocks and scion material. The repository has also, under agreement with variety owners, increased its production of certified budwood of many new emerging varieties. This is to ensure there will be certified wood available for distribution to licensed nurseries once licensing is complete.

Quarantine

A key role of APFIP is to liaise with Australian Quarantine and Inspection Service to ensure the industry is adequately protected from exotic disease. APFIP also works to reduce post entry quarantine periods to ensure Australia's international competitiveness is not impacted. The major role in the past year has been liaison with the Commonwealth related to the establishment and commissioning of the new quarantine facility at Attwood, near Melbourne Airport.

Australian Pome Fruit Improvement Program Ltd

Horticulture Innovation Australia

7. Tree Procurement Service DL

The broad aims of the proposed APFIP Tree Procurement Service (TPS) are to

- To improve growers awareness of the nursery tree options available to growers (certified/ non-certified, rootstocks, tree architecture etc) and to help them specify the tree they want.
- Empower growers in their negotiations with nurseries - particularly with respect to setting a detailed specification for the trees they require.
- To provide nurseries with a detailed specification of the trees required by a grower.
- To ensure growers receive the trees they order.
- To improve interactions between growers and nurseries and to promote the value of certification to growers and nurseries.

The service will do this by

- Liaising with the grower.
- Liaising with the nursery.
- Promoting a two way flow of information between the grower and the nursery related to:
  - *Grower to nursery: the specification*
  - *Nursery to grower: costs and tree production issues*

APFIP's role is to help the grower set the best possible (achievable) tree specification and to ensure that the delivered trees meet or exceed that specification. It would not;

- ***Be an agent for the nursery***
- ***Be an agent for the grower***
- ***Engage in selling the nursery's left over trees***

For more detailed information on how the nursery tree procurement service could work for you, growers and nurseries should contact APFIP at the earliest opportunity.

This Project has been facilitated by HAL in partnership with Apple and Pear Australia Limited and has been funded by the Apple and Pear levy. The Australian Government provides matched funding for all HAL's R&D activities.

HAL

Know-how for Horticulture™

Australian Pome Fruit Improvement Program Ltd

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Australian Pome Fruit Improvement Program Ltd

Nursery Tree Procurement Service

Certified

Australian Pome Fruit Improvement Program Ltd

Nursery Tree Procurement Service

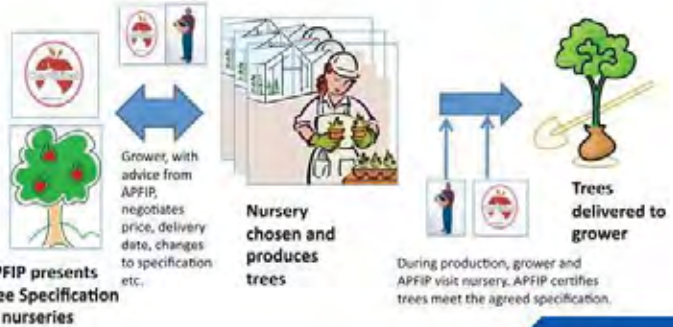
As the introduction of APFIP certified nursery trees into our industry begins to take place APFIP has identified the need for an information pathway between growers and nurseries.

With this in mind APFIP has developed a proposal for a Nursery Tree Procurement Service. The service that APFIP is proposing is aimed at closing the gap between growers and nurseries, allowing growers to better understand the issues nurseries face in the production of nursery trees as well as understanding what is required when placing an order with a nursery. This in turn will allow nurseries to better understand the grower's production situation and their needs when purchasing nursery trees.

APFIP would enter a simple agreement with the grower to be the link in working with them and the nursery in the production of their nursery trees to achieve the best outcome for both the grower and nursery.

Australian Pome Fruit Improvement Program Ltd

In broad detail, this is how the TPS will operate.



8. APFIP Certification DL

The benefits of certified propagating material were clearly described in a research project that was completed in Australia in 1988 (*Comparative Performance of Three Apple Clones Derived from a Virus-Tested Scheme, with Clones Infected with Latent Viruses and a Mycoplasma. L.J Penrose, K.C Davis & B.J Valentine*). This trial "compared the performance of three apple cultivars ('Jonathon', 'Richared Delicious' and 'Granny Smith') propagated from using budwood and rootstocks from a virus-tested scheme with trees propagated from sources known to be latently infected with viruses and a mycoplasma".

"Over a 3-season period VT 'Jonathon' trees out yielded infected trees by 56%, VT 'Richared Delicious' out-yielded them by 40%, and VT 'Granny Smith' by 41%". The VT trees were slightly larger than the infected trees.

"Because of the structure of the trial, it was not possible to apportion the differences noted between those due to virus/mycoplasma diseases, and those due to clonal variations. However, it is clear that the use of selected scions and rootstocks from the VT scheme provided a significant increase, in fruit yield, with only a small increase in overall tree size, and therefore such a scheme can be of considerable advantage to industry".

Certification systems have been operating in Europe and NorthAmerica for the past 30 years with wide industry support. They were adopted because their own research in this area had shown that there were significant improvements to orchard yields if nursery trees were certified.

Following extensive consultation in Australia and investigation of European certification systems APFIP has introduced its own Certification system for fruit tree propagating material, which operates under this certification Trade Mark. There are a number of components to the APFIP certification system that will ensure benefits to growers from the nursery trees they purchase. These are:

- Virus status (tested negative for the following viruses, apple chlorotic leaf spot, apple stem grooving, apple stem pitting and apple mosaic),
- Trueness to type
- Minimum nursery tree standards, and
- The ability to trace the trees back to the budwood/ rootstock source

▶ To establish the system APFIP introduced a range of industry standard varieties and rootstocks into heat treatment in the winter of 1998 to re establish them in a known state and tested negative for the viruses of economic significance list above. Crop Health Services at Knoxfield (Vic.) were contracted to complete this task and they used the services of the AQIS plant quarantine station also at Knoxfield to undertake the heat-treatment in the first instance but have now developed their own capability.

It is possible to have the virus testing to meet the certification requirements completed whilst new introductions are in the Post-Entry Quarantine (PEQ) system. This will result in new introductions meeting the virus status requirements upon release. Importers need to manage the new material once released in accordance with the certification system to ensure that it can meet the other certification requirements. Varieties and rootstocks to be entered into the certification system need to be assessed for trueness to type. This is conducted by APFIP once the candidate trees are fruiting. Minimum nursery tree standards are included in the certification system. APFIP has developed a nursery tree description and specifications that detail the ideal requirements and is aimed at helping growers to purchase nursery trees that suit their purpose (some of these are described overleaf). They are available from the APFIP office on request or on the APFIP website (www.apfip.com.au).

The Trade Mark will be displayed on the nursery tree tag with one tag for each certified nursery tree. In the case of rootstocks there will be one tag for every bundle of 50 certified rootstocks. APFIP will collect a Trade Mark fee for each tag used. APFIP aims to license the use of the certification Trade Mark to producers of nursery tree and rootstocks who meet the Trade Mark requirements. Details of the current licensees are available from the APFIP Office. The certification rules are available on the APFIP website or by contacting the APFIP office.

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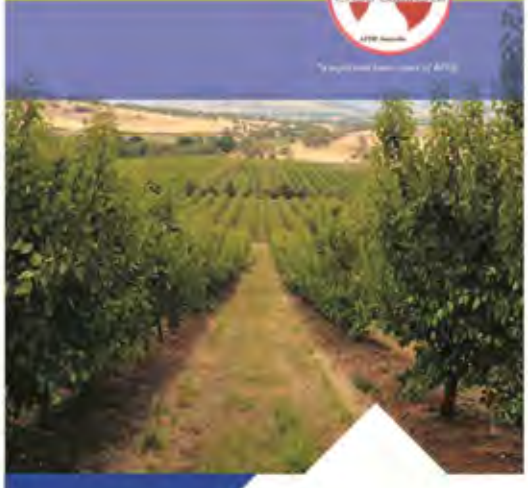
www.apfip.com.au

Australian Pome Fruit Improvement Program Ltd

Certification System



HAL
Horticulture Australia

Australian Pome Fruit Improvement Program Ltd

The Australian Pome Fruit Improvement Program Ltd Certification System

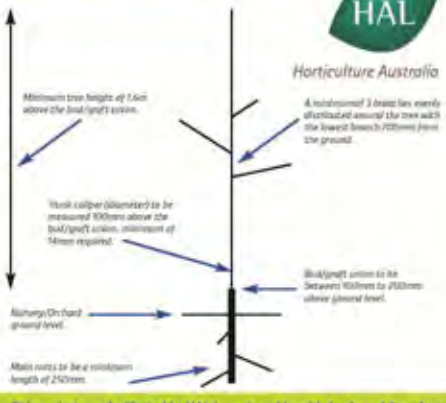
Summer budded trees: Production and description

This is a 2-season process. Rootstocks are planted in spring (September) and budded in summer (February). The stocks are left in the ground for winter and are headed off at the bud in the late winter (August). The bud is then grown into a tree in the second season.

Minimum tree specifications for summer budded trees in addition to the general requirements.

- 3 branches distributed evenly around the tree
- The lowest branch is to be a minimum of 700mm from the ground; this will vary according to the growing characteristics of the variety.
- Branches are to meet the 3 to 1 rule. That is branches have a diameter no more than 30% of the trunk diameter.

TREE DIAGRAM (not to scale)



Horticulture Australia

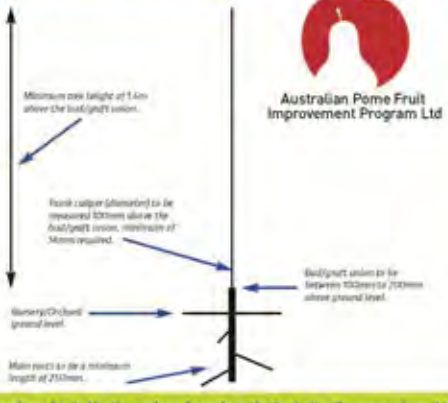
1-year-old whips or rods: Production and description

This is a 1-season process. Rootstocks are bench grafted in the winter and planted in the spring. The top or best shoot is encouraged and a tree with a single trunk is grown during the growing season. Trees are lifted in the next winter for delivery.

Minimum tree specification for 1-year-old whips or rods in additionto the general requirements

- Trees to be straight

TREE DIAGRAM (not to scale)



Australian Pome Fruit Improvement Program Ltd

2-year-old knip tree (European style trees): Production and description

This is a 2-season process. Rootstocks are bench grafted in winter and planted in spring. The best shoot it promoted to form a single stem during the growing season. The tree is left in the nursery and headed at the required height (approx 750mm above the ground depending on the variety) at the end of the second winter. The top bud is promoted and the tree branches are grown on the new growth. A number of techniques are practiced to encourage branching on the new growth. Trees need to be supported in the nursery for this process to be successful.

Minimum tree specifications for knip boom trees in addition to the general requirements.

- 6 branches distributed evenly around the tree
- The lowest branch is to be a minimum of 800mm from the ground; this will vary according to the growing characteristics of the variety.
- Branches are to meet the 3 to 1 rule. That is branches have a diameter no more than 30% of the trunk diameter.

TREE DIAGRAM (not to scale)

www.apfip.com.au

This project was facilitated by HAL in partnership with Apple and Pear Australia Ltd and was funded by the apple and pear levy, the Australian Government provides matched funding for all HAL's R&D activities.

9. APFIP Nursery Tree specifications

Australian Pome Fruit Improvement Program Ltd.

Nursery Tree Specifications & Tree Types Description

This tree specification and tree types description is provided as a "**guide**" to assist those involved in the Australian pome fruit industry to establish final delivery specs for nursery trees. ***(The rootstock/scion combination is also essential in this process and needs to be arranged directly between the grower and the nursery tree supplier)***

General Requirements

Suppliers growing and providing apple trees for Australian Orchards shall ensure that each tree that is delivered is:

- Produced from bud and graft wood from trees that are virus tested for and free of the following viruses, apple stem-pitting virus, apple stem-grooving virus, apple mosaic virus & apple chlorotic leaf spot virus. Rootstocks used in the production of the nursery trees are to come from production areas that have been indexed for the above viruses.
- Produced from trees that are true to type, that is it meets the pomological specification of the variety.
- Budded/grafted onto the rootstock at a minimum of 200mm above the ground and not more than 300mm.
- A minimum calliper size (trunk diameter) of 12mm measured 100mm above the graft/bud union.
- A minimum height of 1.6 metres measured from the bud/graft union.
- Left with a root system following lifting that can adequately support the tree, where possible the main roots are to be a minimum of 250mm in length. The tree is to be free of residual soil.
- Has minimal damage from mechanical harvest or other operations.
- Free from obvious lesions, pests (woolly apple aphid) diseases (apple scab and powdery mildew). Treatment for pests and diseases can only be with chemicals registered for that purpose.
- Not treated with any chemicals to accelerate defoliation of leaves other than low biuret urea and copper formulations, hand striping of leaves can occur.
- Grown and supplied in accordance with the phytosanitary requirements of the state where the trees are grown.
- Bundled and transported to ensure that absolute minimal damage can occur and that tree roots remain damp.

These general requirements are to be used in conjunction with the following tree descriptions.

Summer Budded Trees Production and Description

This is a 2-season process. Rootstocks are planted in spring (September) and budded in summer (February). The stocks are left in the ground for winter and are headed off at the bud in the late winter (August). The bud is then grown into a tree in the second season.

Minimum tree specifications for summer budded trees in addition to the general requirements.

- 3 branches distributed evenly around the tree
- The lowest branch is to be a minimum of 900mm from the ground; this will vary according to the growing characteristics of the variety.
- Branches are to meet the 3 to 1 rule. That is branches have a diameter no more than 30% of the trunk diameter.

Tree Diagram (not to scale)

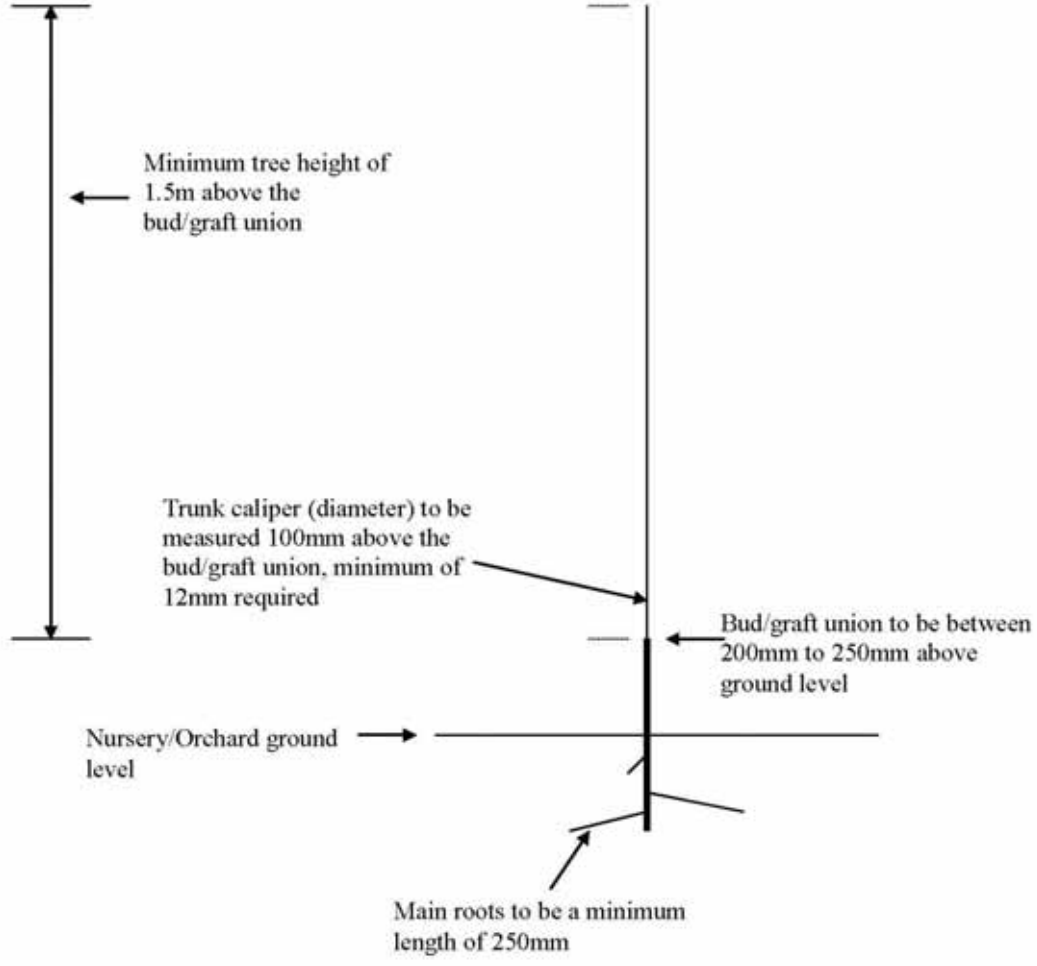
1-year-old Whips or Rods Production and Description

This is a 1-season process. Rootstocks are bench grafted in the winter and planted in the spring. The top or best shoot is encouraged and a tree with a single trunk is grown during the growing season. Trees are lifted in the next winter for delivery.

Minimum tree specification for 1-year-old whips or rods in addition to the general requirements

- Trees to be straight

Tree Diagram (not to scale)



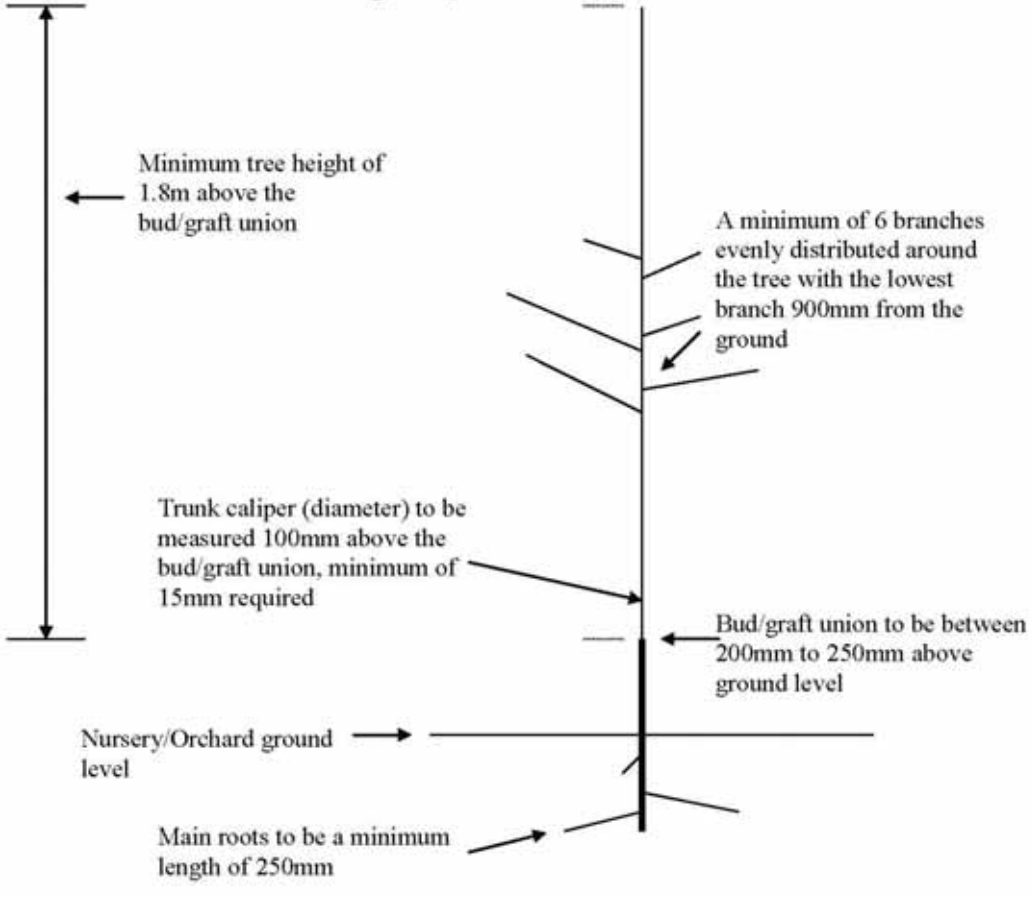
2-year-old Knip Tree (European style trees) Production and Description

This is a 2-season process. Rootstocks are bench grafted in winter and planted in spring. The best shoot it promoted to form a single stem during the growing season. The tree is left in the nursery and headed at the required height (approx 750mm above the ground depending on the variety) at the end of the second winter. The top bud is promoted and the tree branches are grown on the new growth. A number of techniques are practiced to encourage branching on the new growth. Trees need to be supported in the nursery for this process to be successful.

Minimum tree specifications for knip boom trees in addition to the general requirements.

- 6 branches distributed evenly around the tree
- The lowest branch is to be a minimum of 900mm from the ground; this will vary according to the growing characteristics of the variety.
- Branches are to meet the 3 to 1 rule. That is branches have a diameter no more than 30% of the trunk diameter.

Tree Diagram (not to scale)



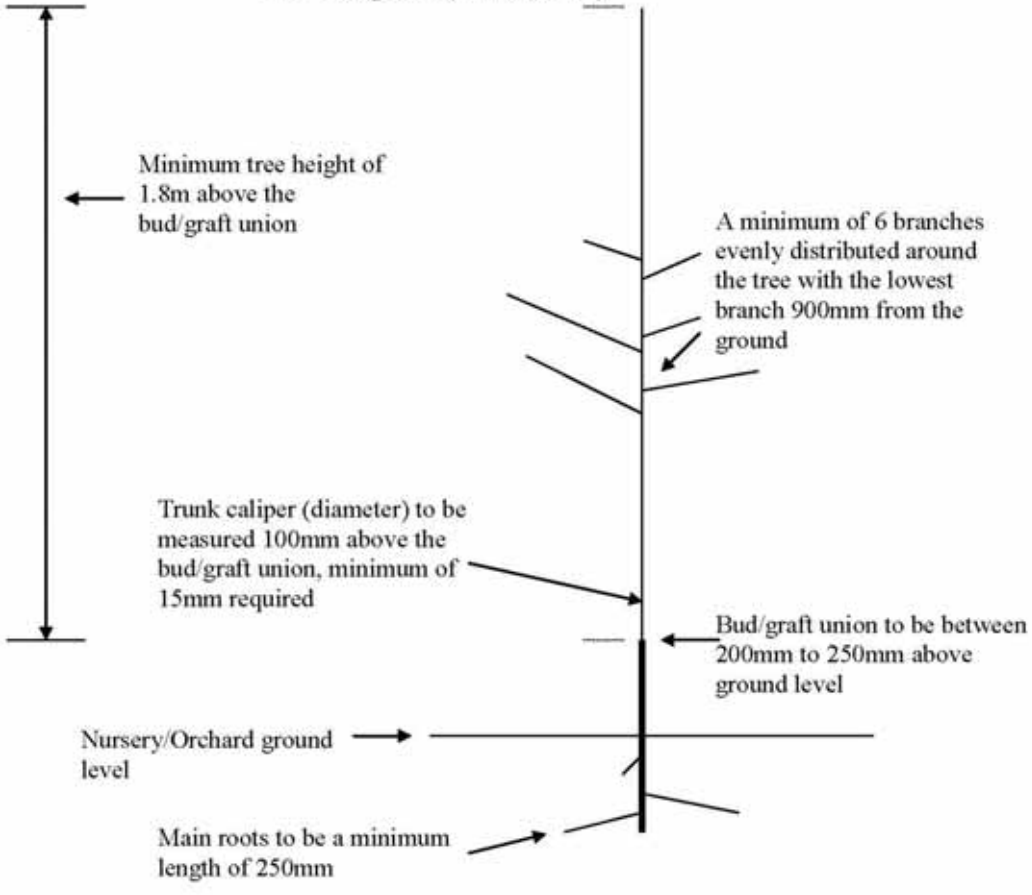
2-year-old Knip Tree (European style trees) Production and Description

This style of tree can also be produced via summer budding, which is a 3-season process. Small liner size rootstocks are planted in spring and budded in February. The rootstocks are then lifted as dormant buds in the winter sorted and replanted in the next spring the bud is promoted to form a single stem during the growing season. The tree is left in the nursery and headed at the required height (approx 750mm above the ground depending on the variety) at the end of the second winter. The top bud is promoted and the tree branches are grown on the new growth. A number of techniques are practiced to encourage branching on the new growth. Trees need to be supported in the nursery for this process to be successful.

Minimum tree specifications for knip boom trees in addition to the general requirements.

- 6 branches distributed evenly around the tree
- The lowest branch is to be a minimum of 900mm from the ground; this will vary according to the growing characteristics of the variety.
- Branches are to meet the 3 to 1 rule. That is branches have a diameter no more than 30% of the trunk diameter.

Tree Diagram (not to scale)



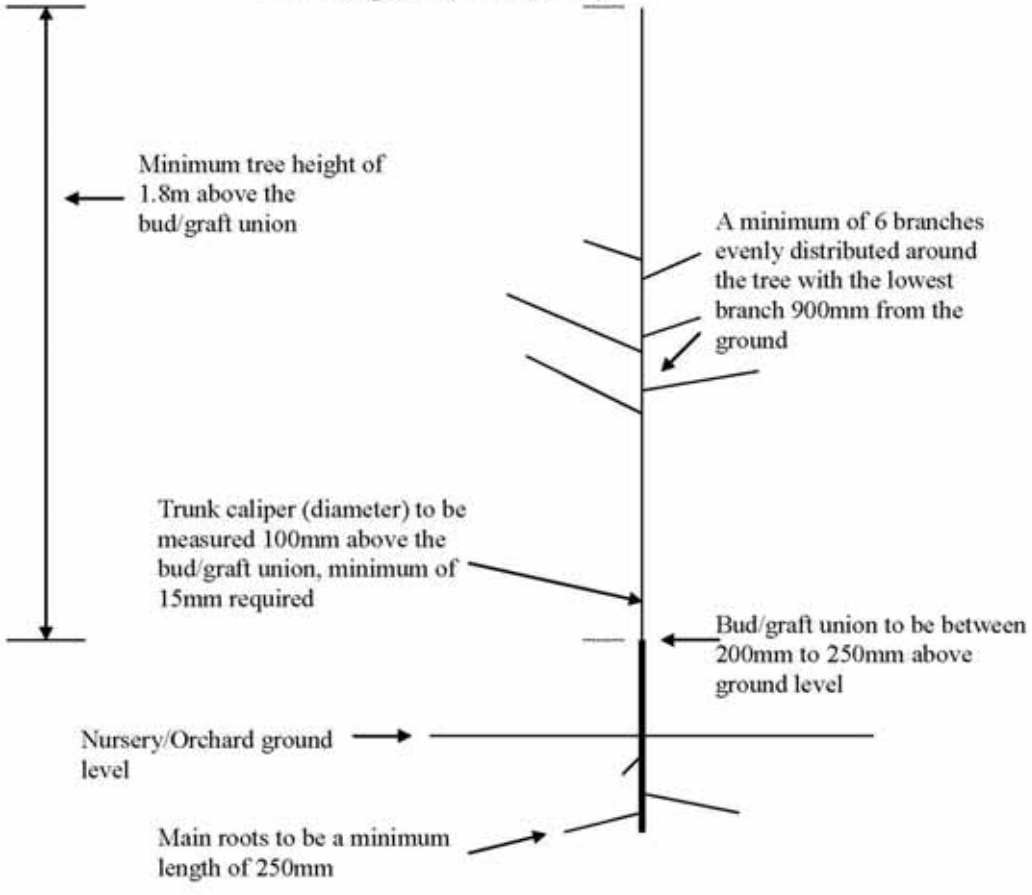
2-year-old Spring Budded Trees Production and Description

This is a 2-season process. Liner size rootstocks are planted in spring and budded in late November or early December. The bud grows almost immediately and is promoted to form a single stem during the remainder of the growing season. The tree is left in the nursery and headed at the required height (approx 750mm above the ground depending on the variety) at the end of the second winter. The top bud is promoted and the tree branches are grown on the new growth. A number of techniques are practiced to encourage branching on the new growth. Trees need to be supported in the nursery for this process to be successful.

Minimum tree specifications for 2-year-old spring budded trees in addition to the general requirements.

- 6 branches distributed evenly around the tree
- The lowest branch is to be a minimum of 900mm from the ground; this will vary according to the growing characteristics of the variety.
- Branches are to meet the 3 to 1 rule. That is branches have a diameter no more than 30% of the trunk diameter.

Tree Diagram (not to scale)



10. Variety Active Numbers Register

APFIP Material Register and Evaluation Status

• Inactive • Active/year planted • Current Status

Apples — *APFIP Evaluation Areas* — **Last Updated 7/3/2016**

Due to the confidentiality and IP issues, variety names have been left out of this sheet for the milestone.

Variety	*Supplier*	Huon Valley Calverts	Tamer Valley Clarthorpe	Goulburn Valley Bolithio	Goulburn Valley Turnbull	Yarra Valley Johns	Orange Perry	Orange NSW Station	Manjimup Casarins	Manjimup MHRI Station	Lenswood Green	Lenswood Wrenham	Batlow Wilson	Stanthorpe Rizzato	Stanthorpe Daff Station	APFIP REPOSITORY TAS	PEQ	General access	Eliminated	Supplier data only	Still being evaluated
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11. Certification Demonstration Site Report

AUSTRALIAN POME FRUIT IMPROVEMENT PROGRAM

Tree Certification Trial

Trial aim:

As certified nursery trees (*tested negative to viruses known to have an economic effect on the trees performance*) start to enter the industry. Apfip identified the need to set up basic trial to show growers the advantages of planting certified material. Apfips aim is to evaluate tree vigour, crop yield and packout of the 2 combinations.

Trial Set-Up:

The trial has 3 separate blocks, Huon Valley Tas, Lenswood SA and Stanthorpe QLD. Each block consists of 500 trees of Gala on M26 rootstock, 250 trees certified and 250 non-certified. Management of blocks is completed by hosting growers, all blocks are currently under drip irrigation.

Observations:

Evaluation so far is only been on vigour Tree High and Trunk Cross Sectional Area(TCSA) are the parameters used. As the data for each block shows below, we continue to see an increase in these parameters from the certified trees over the non-certified. The increase percentage is varying on a annual basis, a consistent increase of around 15% is to be expected from certified material. We have had a couple of issues that could vary our expectations, tree quality at planting in the Huon and Lenswood blocks were considered to be 2nd and 3rd grade trees.
As well the Huon block has suffered replant disorder even after fumigation which has impacted the collection of vigour data up till now.
Commercial crops of fruit are expected in both Lenswood and Stanthorpe in season 2015/16, evaluation of yield and packout will start from next harvest.

Anyone requirng more info on the trial can contact APFIP on ***0408 503 528 or mark@apfip.com.au.***

Horticulture Innovation Australia

Evaluation Results Hansen Certified Demo Block (TAS)

notes ***September 2012 planting***

Ground - replant fumigated, gray mudstone

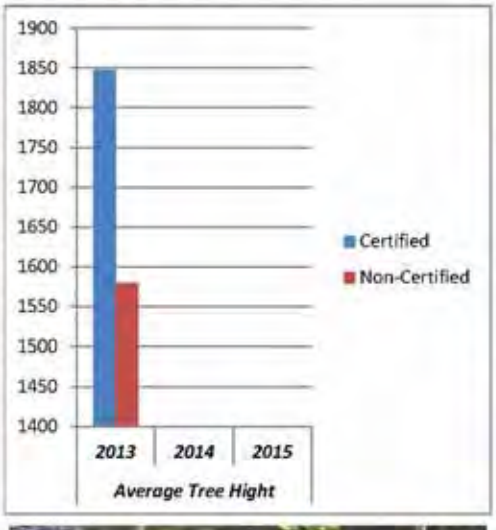
Trellis - no trellis for the first growing season

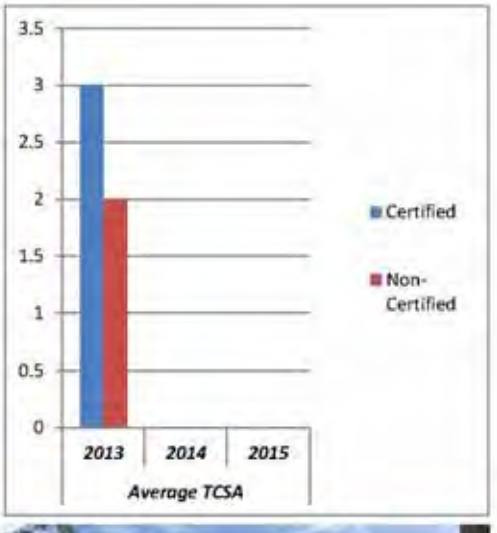
Tree quality - budded combination of grade 1 & 2

Observations 2015 end of 3rd leaf after planting

Due to replant disorder, this blocks vigour comparison has not been evaluated for the past 2 seasons. Trees this winter have been poled back as photos shows to in an attempt to get the block more even. Apfip still hopes some fruit data can be recorded once cropping.

Increase over non-certified trees	*Tree Height*	*TCSA*
2013	17%	50%
2014	N/A	N/A
2015	N/A	N/A





Evaluation Results Rizzato Certified Demo Block (QLD)

notes ***September 2012 planting***

Ground- replant fumigated, light gray

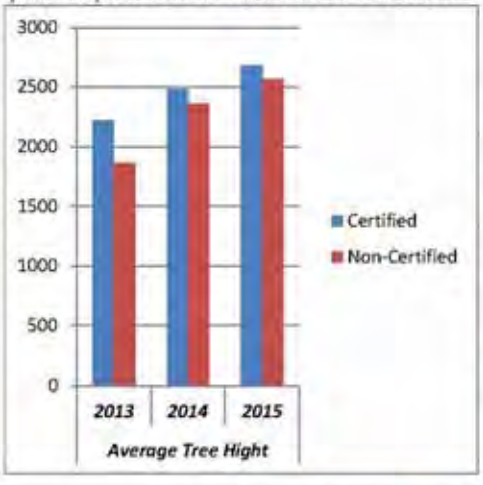
Trellis- installed during first growing season Vee trellis

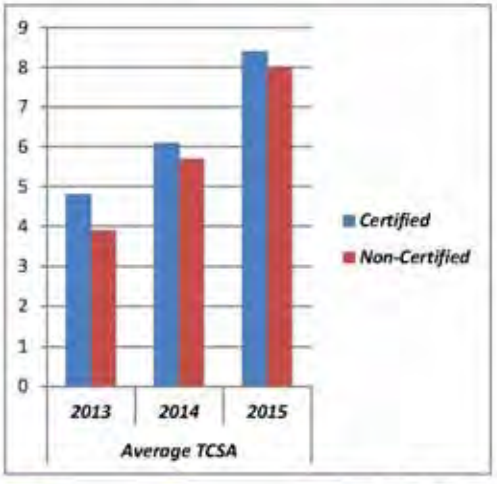
Tree quality- Very good combination of both budded and 2yld grafts

Observations 2015 end of 3rd leaf after planting

Tree performance in this site is very good, we continued to see an increase in all tree height and TCSA during the 2014/15 season. The increase percentage continues to drop as the trees matures. This may be due to this block caring a commercial crop of fruit last season. Due to hail prior to harvest fruit yield and packout could not be evaluated. Tree height consistency is one observation made in the certified trees over non-certified. Apfip expects this site will set a commercial quantity of fruit in the 2015 spring, yields and packout can then be evaluated harvest 2016.

Increase over non-certified trees	*Tree Height*	*TCSA*
2013	16%	18%
2014	5%	6%
2015	4.3%	4.7%





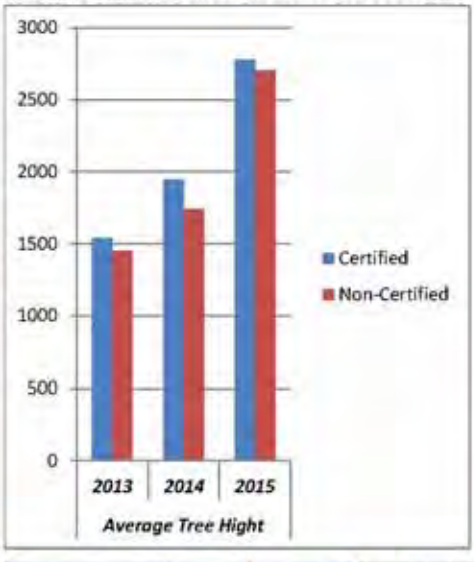
Evaluation Results Brockoff Certified Demo Block (SA)

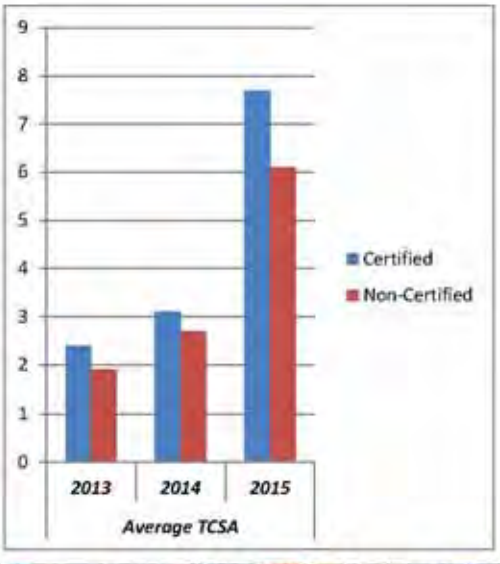
notes ***September 2012 planting***
Ground- Replant, red loam/clay
Trellis- Installed during first growing season
Tree quality- combination of 2 & 3 grade rods all headed at 900mm

Observations 2015 end of 3rd leaf after planting

This site continues to develop well, like the Hansen block tree quality at planting is having early effects on tree performance. We continued to see an expected increase in certified over non-certified in tree height and TCSA. It is expected that these trees will carry a small amount of fruit in the 2015/16 season.

Increase over non-certified trees	*Tree Height*	*TCSA*
2013	6%	31%
2014	12%	18%
2015	2.7%	27.8%





12. APFIP Speed Updating Presentation

Australian Pome Fruit Improvement Program Ltd
(APFIP)

Presentation to **"Speed Updating"** seminar,
June 2015

Mark Hankin,
Evaluation Coordinator
APFIP

APFIP: What we do

- Variety Evaluation
- Tree propagule Certification
- Quarantine liaison/oversight
- Tree Procurement advice/assistance
- Trials – e.g. Pear Rootstock trial

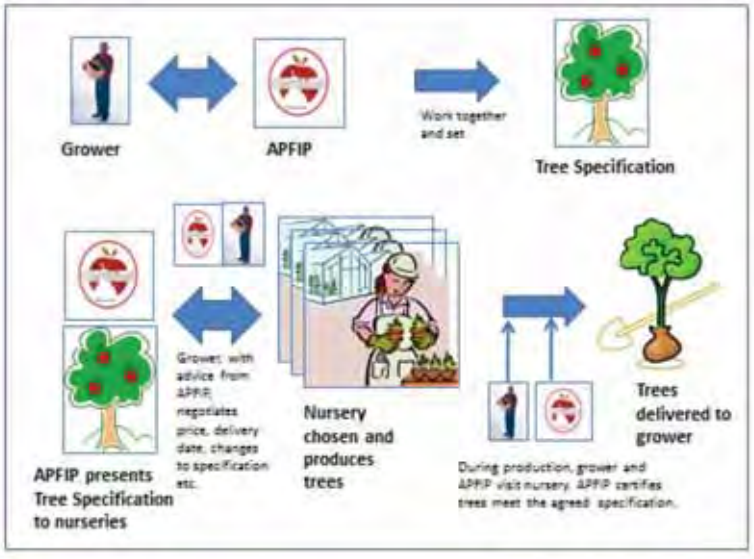
Variety Evaluation

- 8 sites
- 166 apple cultivars
- 66 pear cultivars
- 19 material suppliers
- Evaluation data uploaded at site
- Confidential until released

Tree Propagule Certification

- Certification standards for tree propagules
- Trees that comply can receive Certification Trade Mark
- 10 approved APFIP-Licensed nurseries
- Certified material shown to be free of important viruses

Tree Propagule Certification



Tree Procurement Scheme

- Helps growers and nurseries close information gap.
- Help growers identify and finalise their needs.
- Nursery tree specification guide.

Contact: mark@apfip.com.au
mobile: 0408 503 528
Website: www.apfip.com.au

Tree Propagule Certification: Certified Tree Demonstration Sites

- Located in (i)Huon Valley, (ii) Stanthorpe, (iii) Lenswood
- Goulburn Valley coming
- 500 trees per site
- ALVINA® Gala on M26 stock
- 50% certified propagules
- 50% non-certified materials
- Large differences in growth

Oversight of Quarantine Issues for the industry

- APFIP represents the industry on the Post Entry Plant Industry Consultative Committee (DoA)
- Through this role has APFIP has significantly reduced the post-entry quarantine time for apples and pears – leading to more rapid introduction of new varieties

Trial Work – Pear rootstock trial in the Goulburn Valley

Why? – demonstrate the value of new semi-dwarfing stocks for pears in the Goulburn Valley
Outcomes? – Quince stocks "rule"
Importance? – EcoDev follow on rootstock program for pears

In Summary

Variety Evaluation

Tree Propagule Certification

Quarantine oversight and liaison

Important industry infrastructure

www.apfip.com.au

13. APFIP Business Plan 2010 – 2015

Australian Pome Fruit Improvement Program Limited

Business Plan 2010 - 2015

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® registered certification trademark of APFIP

Prepared by:
Australian Pome Fruit Improvement Program Limited

March 2010.

Contents

EXECUTIVE SUMMARY

1. Executive Summary

This plan has been developed for the Company for the period 2010 to 2015. As such it builds on and replaces previous versions of the APFIP Business Plan. The main changes relate to a new set of operational goals for the Certification, Evaluation and Post Entry Quarantine operations of the Company.

1.1 APFIP Business Overview

APFIP is a business with three main enterprises:

- The **certification** of high quality pome fruit rootstocks and nursery trees and their promotion to the Australian industry.
- The provision of **evaluation** services, which generate independent and objective information about the regional performance of existing and new pome fruit cultivars.
- Facilitating the development and implementation of high security and efficient **post-entry quarantine** protocols for the prompt importation of new varieties and rootstocks.

Importance of partnerships with nurseries. Currently, commercial nurseries dominate both pome fruit tree production and the supply of information about the performance of new varieties. While APFIP certified propagules will meet world-class specifications and its evaluation program is vastly more sophisticated and objective, APFIP must continue to develop its relationships with nurseries, variety owners and growers in order to fulfil its vision. Failure to do this for commercial, political, or any other reason will result in the nursery dominated status quo remaining.

Importance of post-entry quarantine role. Secure and rapid post entry quarantine procedures directly impacts on the profitability of all growers by reducing the occurrence of deliberate, illegal imports and the associated risk of exotic pests and diseases.

1.2 Vision and Mission

The **Vision** of the Australian Pome Fruit Improvement Program Ltd is:

"That the Australian Pome Fruit industry will benefit substantially from

- *nursery trees, prepared from certified propagules, being in ready supply; and*
- *excellent technical information on new varieties*

The **Mission** of the Australian Pome Fruit Improvement Program Ltd is three fold…

"To promote and manage an efficient and effective certification scheme for the Australian pome fruit nursery industry.

To develop and deliver to the Australian pome fruit industry independent and objective variety/rootstock information.

To introduce prompt and secure access to new pome fruit varieties and rootstocks through efficient post entry quarantine protocols."

1.3 APFIP Objectives and Strategies

The objectives, strategies and tactics for APFIP, for the period of this plan are:

- Continue to promote the APFIP certification trademark to the Australian pome fruit industry, in particular through promotion of the value of certified rootstocks and nursery trees.
- License nurseries to use the APFIP certification trademark.
- Operate an effective and efficient independent variety evaluation enterprise.
- Build relationships with nurseries so that they use these services and become an efficient means of distribution of high quality products to industry.
- Grow the APFIP enterprise and the relationships with nurseries, breeders and variety owners both in Australia and overseas to such an extent that APFIP products and services become the natural first choice in the Australian pome fruit industry.

2. SITUATION ANALYSIS.

(Description of the Business and the Environment in which it operates.)

2. SITUATION ANALYSIS

2.1 The Business

Name:	Australian Pome Fruit Improvement Program Ltd (APFIP).
Structure:	Not-for-profit company, limited by guarantee.
Owners:	Established for the benefit of the Australian pome fruit industry by the Australian Apple & Pear Growers Association in February 1997. AAPGA became Apple & Pear Australia Limited (APAL) in December 2003.
General Manager:	Garry Langford
Evaluation Coordinator:	Mark Hankin
Contact Details: (General Manager)	35 Turn Creek Road, Grove, Tasmania. 7109. Phone: (03) 6266 4344 Fax: (03) 6266 4023 E-mail: info@apfip.com.au Website: www.apfip.com.au
Contact Details: (Evaluation Manager)	Suite 8, Level 1, 16 Main St, Huonville, Tasmania. 7108 PO Box 273. Huonville TAS 7109 Phone: (03) 6264 1540 Fax: (03) 6264 1143 Mobile: 0408 503 528 E-mail: mark@apfip.com.au

2.2 APFIP Governance

The governance arrangements for APFIP are presented in Figure 1, below.

APFIP operates under an **Agency Agreement** with Apple and Pear Australia Limited (APAL) as part of APAL's Coregeo Division. The General Manager of APFIP reports to the General Manager of Coregeo. The Agency Agreement sets up a series of principles for the operations of APFIP. They include;

- APAL is able to enter into agreements on behalf of APFIP
- APFIP intellectual property is retained by APFIP
- APAL provides direction to APFIP and helps define the role of APFIP
- The cost of APAL's services to APFIP are repaid over time

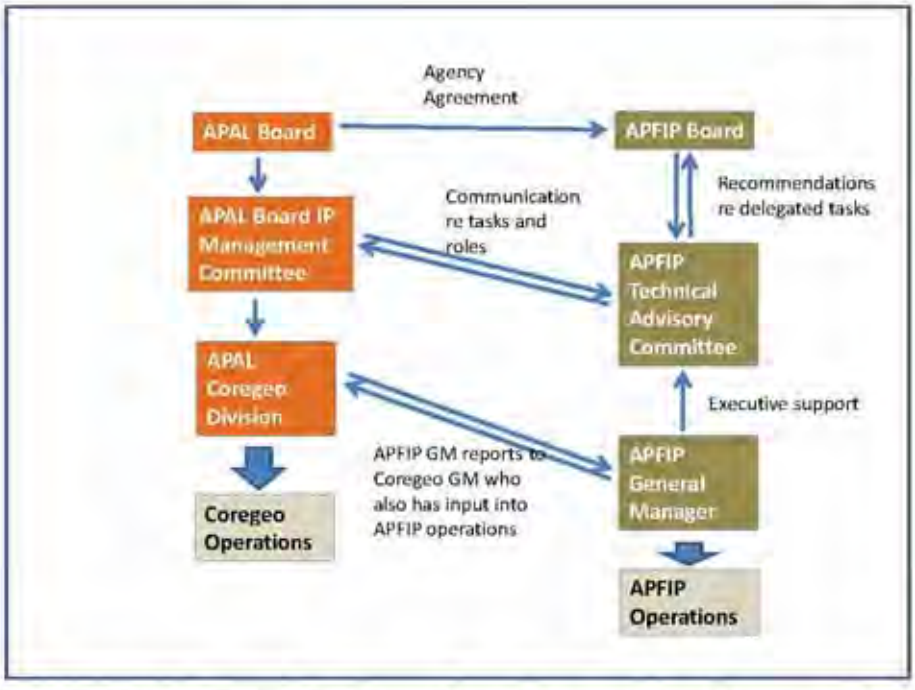

Figure 1: APFIP governance arrangements

2.3 APFIPs existing services

APFIP's main services are described in Figures 2 and 3 below:

Certification Services (Figure 2). These services certify the propagules used by commercial nurseries when they produce apple and pear trees. They essentially relate to the use of APFIP's Certification Trade Mark, by commercial nurseries, in accordance with the trade mark's Certification Rules.

Evaluation Services (Figure 3) relate to the establishment of regional evaluation trials, under appropriate agreements, and the collection and dissemination of data arising from these trials.

Post-Entry Quarantine. The Company aims to facilitate improvements to Australia's Post Entry Quarantine testing protocols to reduce the time new pome fruit germplasm is in quarantine whilst ensuring that Australia maintains its freedom from exotic pests and diseases, particularly fireblight.

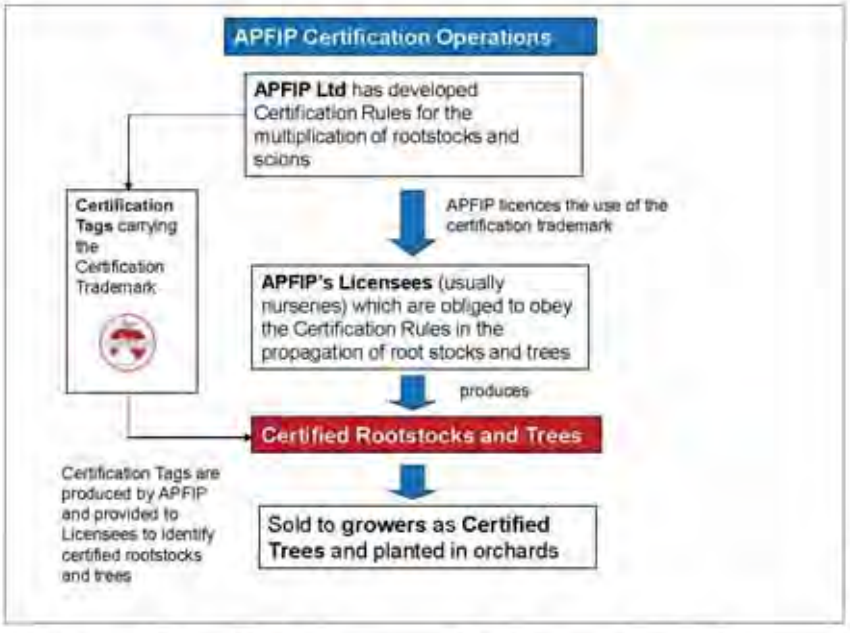

Figure 2. APFIP's Certification Operations

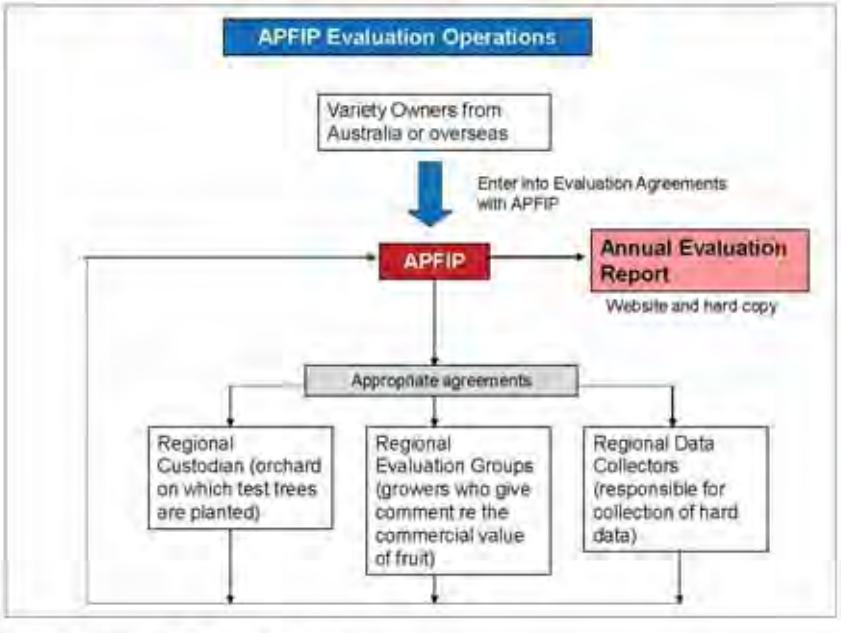

Figure 3. APFIPs Evaluation Operations

2.4 The Environment in which APFIP operates

2.4.1 The Australian Pome Fruit Industry

Because pome fruit growers are the main end-use consumers of APFIP's products and services, a brief analysis of the issues facing the industry, and how they will impact on planting/replanting/reworking of orchards is relevant.

Major issues	Impact on APFIP
Drought/Climate Change	Negative: reduced plantings Positive: as drought wears on, the industry has found ways of coping with reduced water availability resulting in continuation of planting and demand for APFIP services
Importation of apples from NZ and other countries	Positive: Increased pressure to change varieties and growing systems. APFIP certified nursery trees will add value for growers. Negative: some orchards may cease production reducing demand for APFIP products and reduce levy income.
Arrival of more new varieties	Positive: create demand for certified propagation material and evaluation/performance information about the new cultivars Negative: Increase uncertainty in new varieties with a reduction in demand for APFIP services
Increasing pressure to reduce production costs and improve productivity	Positive: will drive demand for higher yielding and earlier bearing "APFIP Certified" trees Negative: some orchards may be forced out of business, reducing APFIP's potential client base
Increased control of varieties	Positive: increased demand for APFIP services particularly evaluation to ensure that varieties are planted in the right areas for their best performance. Negative: some orchards may be forced out of business through inability to access varieties
Demand for "Sophisticated Trees"	With the adoption of propriety varieties, Knip trees, certified propagules etc, trees are becoming increasingly sophisticated and procurement more complex as not all nurseries can provide all required tree attributes

In the 5-year time horizon, the positives outweigh the negatives apart from drought.

2.4.2 Drivers for the adoption of Certification

The shift to only producing certified trees by the Tahune Fields nursery and the production and more-ready availability of larger volumes of fully certified trees will help move the industry towards adoption of certification in general.

Up until now adoption of certification has been delayed by nurseries waiting (largely for administrative reasons) to have all the trees they produce certified. Tahune Fields move, from winter 2012 onwards, to supply only certified trees will drive competitor nurseries to offer the same service.

Similarly, the owners/licensees of new varieties (from Australia or overseas) will want the performance gain associated with certified trees once they become readily available.

2.5 The Market for Certified Pome Fruit Propagules and Evaluation Services.

The Australian Bureau of Statistics provides a ten-year average of the number of apple and pear trees planted each year as follows;

Apples	430,000
Pears	54,000
Total	484,000 trees per year

Rootstock Sales

As all nursery trees produced are grown on rootstocks the total market mirrors current nursery tree production at 484,000 per year. Direct rootstock sellers account for approximately 120,000 stocks with the balance produced by nurseries for sale as finished nursery trees.

As demand for dwarfing stocks is high and the majority of the current stocks are in the public domain, there is ample scope for APFIP to reintroduce these in a certified state

Major trends in the market in the next 5 years

The major trends likely to emerge in the market in the 5-year horizon are:

- Introduction and adoption of new varieties.
- Demand for dwarfing rootstocks to increase - particularly in the M9 to M26 size range.
- Increased private ownership of varieties.
- Increased "closed loop" licensing deals locking up varieties with one or more parties.
- Shorter commercial life of varieties as more new varieties become available
- Demand for disease resistant cultivars driven by consumer concern over the use of pesticides.
- Increased demand for sophisticated, highly specified trees

2.6 The Market for Evaluation Services

APFIP has developed a range of evaluation products to offer to its evaluation customers.

Customers wanting evaluation services are generally variety owners (or parties holding the Australian rights to a variety) that come to APFIP to use the evaluation service prior to

developing commercial agreements in Australia. These groups are seeking independent performance data to use in the commercialisation process for the variety.

The key attributes that such customers require from an evaluation service are independence, timeliness, security of propagation material, confidentiality and quality of the information collected (reliability, accuracy, objectivity, etc).

2.7 Competition

In Australia, there are no other companies offering services similar to those provided by APFIP.

Competition for APFIP comes (mainly) from nurseries who produce trees from non-certified propagules or certify their propagules by a system independent of APFIP. For example three large nurseries and the Tasmanian Department of Primary Industries Water and Environment have in-house "certification" systems that are not documented. Many smaller nurseries and fruit producers who have a nursery sideline produce uncertified rootstocks and nursery trees. All these will see the cost of certification as one reason not to be involved in certified rootstocks and nursery trees.

The following table describes the three large nurseries.

Company	Apple Market Share (%)	International Linkages	Comments
Fleming's Nurseries	20%	Member of the International Nursery Network	High priced trees. Aggressive marketing, well-organised, good distribution, good quality.
Aust Nurseryman's Fruit Improvement Co (ANFIC) - now includes Forest Home Nursery and Tahune Fields Nursery	50%	Member of the Associated International Group of Nurseries	Mid range price and good quality, group structure hinders some operations, less aggressive. Strong push to control of varieties.
Tangara Nursery	15%	Not aligned	Inexpensive producer with strong grower contacts. Good quality trees.
Other Nurseries	15%	None	Small operations and grower nurseries

2.8 Sustainable Competitive Advantage

Sustainable Competitive Advantage related to certified propagule supply.
Trees produced from APFIP-certified propagules have higher yields and much earlier fruiting than non-certified material. This is a major, "free" bonus for growers buying such trees. Trees produced from APFIP-certified propagules should be attractive to all purchasers of nursery trees and rootstocks (growers and nurseries alike).

Sustainable competitive advantage related to the Evaluation Network
The sustainable competitive advantages of APFIP's evaluation service are its independence and accessibility. Other evaluation programs exist but these are either not independent (e.g. operated by a variety owner for a variety or suite of varieties) or private (e.g. operated by a large producer for their own information).

Other Sustainable Competitive Advantages
Another area of competitive advantage is in the knowledge and experience of the key staff - the General Manager and Evaluation Co-ordinator. This knowledge and experience relates to both the pome fruit industry and the nursery industry. It includes knowledge of, which nurseries best produce particular types of trees, the attitudes of various nurseries to the use of certified propagules, the importance of various varieties and stocks to the growing industry, overseas trends in all of the above etc.

This knowledge and experience can be utilised commercially for new APFIP services such as a tree procurement service.

2.9 SWOT Analysis of the APFIP business

Strengths	Weaknesses	Opportunities	Threats
Grower owned.	Operating against established systems/businesses (eg nurseries), which have to be converted to customers if APFIP is to be successful.	Win nurseries and breeders to evaluation scheme such that they discontinue their own evaluation processes.	Inability to win nurseries and local breeders to the evaluation scheme
Independent from existing nursery businesses	Operating on the principle of "industry good".	Closed loop variety management requires independent data to promote the product. This opens the opportunity for APFIP to be the independent supplier of evaluation information Australia wide.	Inability to win nurseries as approved users of the APFIP certification
Certification scheme with trace back capability to differentiate APFIP propagules from their competition.	There are long lead times on implementation of many of the company objectives.	Be the major evaluator of rootstocks	Litigation risk re; loss of trueness to type, virus status, etc.
Levy funding (and matching HAL funding) enabling the cost of APFIP services to be equitably shared across industry.		Could include other tree crops (eg nashi, stone fruit) in the APFIP	Levy payers deciding to discontinue the levy.
Knowledge and experience of key staff		To provide services (e.g. tree procurement) based on the knowledge and experience of the key staff	Continuing fall in Australian production impacting on levy income.

3. THE BUSINESS PLAN

(Vision, Objectives, Strategies, Tactics)

3. THE BUSINESS PLAN

3.1 The Vision and Mission of APFIP

The Vision of the Australian Pome Fruit Improvement Program Ltd is …

"That the Australian Pome Fruit industry will benefit substantially from

- *nursery trees, prepared from certified propagules, being in ready supply; and*
- *excellent technical information on new varieties*

The Mission of the Australian Pome Fruit Improvement Program Ltd is three fold…

"To promote and manage an efficient and effective certification scheme for the Australian pome fruit nursery industry.

To develop and deliver to the Australian pome fruit industry independent and objective variety/rootstock information.

To introduce prompt and secure access to new pome fruit varieties and rootstocks through efficient post entry quarantine protocols."

3.2 Objectives of APFIP

Under this Mission Statement, APFIP has the following objectives:

3.2.1 Use of APFIP Certification Objectives

By June 2015, 50% of Australia's pome fruit rootstocks and nursery trees will be produced using APFIP- certified propagules.

By June 2015, 70%of growers enquiring to nurseries for trees request trees propagated with APFIP-certified propagules

Implications

- increasing certification income allows the APFIP levy to be reduced by one third (33%) in the period 2010 to 2015 - from 0.055 cents/kg to 0.037 cents/kg
- Sufficient APFIP-certified rootstocks and varieties area available meet this target
- Effective promotion by APFIP of the benefits of using APFIP certified nursery trees and rootstocks.
- Virus elimination and virus testing protocols are modified as needed to keep them current (e.g. to include new viruses) and state of the art (lowest possible detection limits).

3.2.2 Evaluation Network Objective.

To have the major nurseries (i.e. the ones listed in Section 2.4 above) and all Australian-based pome fruit breeding programs continuing to use APFIP as the regional evaluation program of choice.

Implications

- Build strong relationships with Australian public breeding agencies.

- Build strong relationships with major Australian nurseries.
- Continue to develop relationships with international variety managers and breeding programs.
- Maintain the quality of evaluation by growers, Agriculture Departments, consultants etc continuing to be involved in evaluation.

3.2.3 Post Entry Quarantine Objective

Facilitate research into new pathogen testing techniques that may further shorten the PEQ time. This research will be carried out in conjunction with both Australian and international partners.

Implications

- Build on the already good relationship with AQIS and its high security quarantine stations in Australia.
- Continue to develop relationships with international quarantine agencies.
- Virus testing and elimination system reviewed and modified if required.

3.2.4 Financial Objective

That the APFIP business will continue to attract grower levies and matched HAL funding.

By June 2015, certification fees will account for 50% of APFIP income

Implications

- Continue to grow the certification business. Establish supplies of certified rootstocks & varieties for APFIP certification trademark approved users.
- Continue to expand the evaluation customer base through promoting the value of independent variety information to growers.

3.2.5 New services Objective

That the APFIP business will introduce new services to industry, primarily based on the knowledge and experience of the key staff, and in doing so create a new income stream for the company.

By June 2015, such services will account for 5% of APFIP income.

Implications

- New services have to be conceived, developed, launched and marketed
- Income from such services grows to 5% of turnover (approx $20,000) by 2015

3.3 Strategies to achieve the Objectives

3.3.1 Strategies to achieve Use of APFIP Certification Objectives

By June 2015, 50% of Australia's pome fruit rootstocks and nursery trees will be produced using APFIP- certified propagules.

By June 2015, 70%of growers enquiring to nurseries for trees request trees propagated with APFIP-certified propagules

Strategy One:	**Demonstrate the benefit of APFIP Certified Rootstocks & Nursery Trees.**
	Establish demonstration plantings comparing virus free trees with conventional trees in coordination with grower groups.
	Promote the benefits of APFIP certified rootstocks & nursery trees, trueness to type, virus status and minimum tree specifications.
	Fully implement the certification system including the database (database to produce certification tags) and auditing requirements.
Strategy Two	**Build Relationships with Nurseries & Variety Owners (Australia & Overseas).**
	Maintain dialogue and continue to build trust with nurseries & variety owners
	Licence APFIP M9 and M26 certified stocks to approved nursery users.

3.3.2 Strategies to achieve Evaluation Network Objective

To have the major nurseries (i.e. the ones listed in Section 2.6 above) and all Australian-based pome fruit breeding programs continuing to use APFIP as the regional evaluation program of choice.

Strategy Three:	**Build Relationships with Nurseries & Variety Owners (Australia & Overseas).**
	Maintain dialogue and continue to build trust with nurseries & variety owners
	Enter into agreement with breeders, nurseries and other variety owners for evaluation & other services.
Strategy Four	**Development of Evaluation System**
	Review and update evaluation site operations, site location and data collection with the aim of demonstrating the superiority of the APFIP evaluation scheme .
	Develop a range of evaluation "products" for various customer groups. Products would have different types of services, time frames and prices.
	Ensure reporting is excellent, both by internet and hard copy. Ensure growers know about and can use the internet site

3.3.3 Strategies to achieve Post Entry Quarantine Objective.
Facilitate research into new pathogen testing techniques that may further shorten the PEQ time. This research will be carried out in conjunction with both Australian and international partners.

Strategy Five:	**Shorter PEQ time**
	Continue to liaise with Biosecurity Australia and the post entry quarantine stations regarding PEQ protocols
	Present information to AQIS on improvements to PEQ testing developed both in Australia & Overseas

3.3.4 Strategies to achieve the Financial Objective
That the APFIP business will continue to attract grower levies and matched HAL funding.

By June 2015, certification fees will account for 50% of APFIP income

Strategy Six:	**Manage Incomes Sources**
	Identify all income sources – certification trademark, evaluation, etc
	Project future income flow from sales of these products and services. Main emphasis will be on growth in the use of the Certification trademark.
	Business development visits to the overseas certification schemes, repositories, breeders etc. on a regular basis
	Sourcing and introduction of new technical innovations for APFIP's business.

3.3.5 Strategies related to the new services objective.
That the APFIP business will introduce new services to industry, primarily based on the knowledge and experience of the key staff, and in doing so create a new income stream for the company

By June 2015, such services will account for 5% of APFIP income.

Strategy Seven:	**Develop and promote a tree procurement service for the industry**
	Develop a grower checklist related to the specification of the trees required covering variety, rootstock, certified/non-certified propagules, height, degree of branching, branch height, branch angle etc
	Develop a nursery supply contract setting out tree numbers, price, specifications, % of trees meeting specification etc
	Develop a methodology for assessing nursery trees before they are dug so as to be able to advise the grower of the proportion of trees, in the nursery, meeting the grower's specification.
	If the proportion is below an agreed %, negotiate with the nursery, on behalf of the grower re price etc

3.3 Action Plan

GM = General Manager
EC = Evaluation Coordinator

Strategy No	Task	Criteria	By Who	By When
1. Demonstrate the benefit of APFIP-certified rootstocks and trees.	- Establish demonstration plantings	Demo planting established in 5 production regions.	GM, EC	August 2010
	- Promote the benefits of APFIP certified stocks via Certification Promotion Strategy	Attachment 1 provides a list of the activities that will be used to promote the Certified products to the industry.	GM, EC	On going
	- Full implementation of Certification System including database capable of producing tags and auditing requirements	Data base upgraded to be capable of tag production and meeting audit requirements. SOPS for use of database written	GM, EC	June 2010

Strategy No	Task	Criteria	By Who	By When
2 and 3. Build Relationships with Nurseries & variety owners re • Use of APFIP certified propagules • APFIP evaluation program	- Maintain dialogue and continue to build trust with nurseries, breeders, variety owners etc	At least two face-to-face visits (as distinct from opportune meetings) with each nursery listed in Section 2.6. One face to face visit with each Australian breeding program each year.	GM, EC	Ongoing
	- Licence APFIP M9 and M26 to approved user nurseries	An additional one of the nurseries listed in the table in Section 2.6 to be licensed to use the APFIP M9 and M26 stocks each year - making all nurseries using the APFIP stocks by 2015	GM	30 June 2015
	- Renew existing agreements and enter into further evaluation agreements with breeders, nurseries and other variety owners	By 30 June 2015, each nursery in Section 2.6 to have entered into an evaluation agreement with APFIP. 80% of all new pome fruit varieties entered in the APFIP evaluation program At least one new evaluation agreement with a new variety owner/manager per year - making 5 new owners/breeders contracted to APFIP by 2015	GM, EC	30 June 2015

Strategy No	Task	Criteria	By Who	By When
4. Development of Evaluation System	- Review & update sites, operations and data collection	"Australian Fruitgrower" articles pointing out the advantages of APFIP evaluation system. 2 per year.	EC	Ongoing
	- Develop a range of evaluation products for various customers	Three new products developed, documented, priced and approved by the Board.	EC	30 June 2012
	- Ensure access to evaluation information	Have evaluation information publications reviewed by external-to APFIP, APAL staff. Implement recommendations.	GM	30 June 2011
5. Shorter PEQ Time	- Continue to liaise with Biosecurity Australia and AQIS	GM to continue role on PEPICC	GM	Ongoing
6. Manage Income Sources	- Identify and quantify APFIP income sources, particularly certification	Part of annual budget development and approval process	GM	Annually in line with financial year
	- Business/income development	Include new income streams in annual budget development	GM, EC	Ongoing
7. Develop New Services	- Develop tree procurement service including specification check list, contracts and in-nursery tree assessment	Scheme is developed	EC, GM	31 Dec 2010
	- Promote scheme to industry	Advertisements, presentations etc as per Attachment 1		

4. FINANCIAL ANALYSIS OF APFIP.

4. FINANCIAL ANALYSIS OF APFIP OPERATIONS

4.1 Sources of income, overall picture

APFIP has four main sources of income. They are

- The APFIP levy which is matched by HAL
- Fees associated with use of the Certification Trademark
- Fees collected for evaluation
- Income from non-levy HAL projects
- Other commercial - includes variety/rootstock licensing, consulting, quarantine-related services, interest, etc.

The overlying plan with APFIP income is to increase income from the royalty associated with use of the certification mark to allow reduction in the amount of money needed from the APFIP levy. With this plan in mind it is anticipated that in 2011/12 (from 1 January 2012) the levy will be reduced from 0.055cents/kg to 0.037 cents/kg.

4.1.1 APFIP Levy income

The table below sets out likely levy income for the period of this Business Plan. The reduced levy rate (0.037 cents/kg) comes in for 2011/12. HAL project for matching funds is AP10000

Financial Year	Year of Levy Collection	Est. Levy @ 0.0055 cents per kg.	Contribution from APFIP levy reserves ($)	Total APFIP collection ($)	APFIP income after HAL matching ($)
2010/11	2101/11	120,000.00	-	110,000	220,000
2011/12	2011/12	100,000.00	10,000	110,000	220,000
2012/13	2012/13	80,000.00	20,000	100,000	200,000
2013/14	2013/14	80,000.00	8,000	88,000	176,000
2014/15	2014/15	80,000.00	22,000	102,000	204,000

4.1.2 APFIP Certification Income

Estimated income from the certification trade mark is documented in the table below

Year	Projected sales cert trees	Total annual income ($)
2010/11	0	0
2011/12	3,600	2,000.00
2012/13	100,000	55,000.00
2013/14	150,000	82,500.00
2014/15	200,000	110,000.00

Note that there is no sharing (with HAL) of royalties arising from use of the certification trade mark until post 2010.

4.1.3 Evaluation Income

Year	Projected evaluation income ($)
2010/11	7,000
2011/12	8,000
2012/13	9,000
2013/14	10,000
2014/15	10,000

4.1.4 Income from non-levy HAL projects

APFIP is conducting two HAL projects: AP04001 (Pear rootstock demonstration trial) and AP08002 (Pear certification, evaluation and quarantine)

Financial Year	Project AP04001 ($)	Project AP08002 ($)
2010/11	12,000	50,000
2011/12	12,000	50,000
2012/13	12,000	30,000
2013/14	12,000	60,000
2014/15	12,000	-

Note: the similar project that preceded AP08002 was AP03018 (Pear certification, quarantine and evaluation).

4.1.5 Commercial income

The table below provides estimates of "other income" earned by APFIP over the period

Financial Year	Quarantine Income ($'000)	Variety/rootstock licensing income ($'000)	Total Commercial Income ($'000)
2010/11	21	13	38.8
2011/12	11	18	39.1
2012/13	11	22	30.6
2013/14	11	27	60.1
2014/15	11	32	36.6

4.1.5.1 Tree Procurement scheme income

Financial Year	Tree Procurement Scheme ($'000)
2010/11	2
2011/12	5
2012/13	10
2013/14	15
2014/15	20

4.1.6 Total income projections for 2010/11 to 2014/15

Summing the values in tables 4.1.1, 4.1.2. 4.1.3, 4.1.4 and 4.15 gives a total income for APFIP in each year.

Year	Levy (matched by HAL) ($'000)	Certif'ion ($'000)	Evalu'tion ($'000)	HAL Projects ($'000)	Com'rcial ($'000)	Tree Proc'me nt	Total ($'000)
2010/11	220	0	7	62	38.8	2	329.7
2011/12	220	2	8	62	39.1	5	336.1
2012/13	200	55	9	42	30.6	10	346.6
2013/14	176	82.5	10	72	60.1	15	415.6
2014/15	204	110	10	12	36.6	20	392.6

4.2 APFIP expenditure and cash flow

The main heads of expenditure within APFIP, and their projected values during the life of this plan, are reported below.

Expenditure area	2010/11 ($'000)	2011/12 ($'000)	2012/13 ($'000)	2013/14 ($'000)	2014/15 ($'000)
Salaries and travel	112.4	120.4	131.2	142.1	155.1
Evaluation	69.7	69.7	69.7	69.7	69.7
Certification and repository	26.8	25.3	27.3	28.6	31.3
Post entry Quarantine	20.7	10.7	10.7	10.7	10.7
Administration	52.5	56.0	59.1	62.6	66.2
Governance and management	45.2	41.8	37.4	37.4	37.4
International Travel	16.9	17.6	17.8	18.0	18.3
Total	**344.3**	**341.7**	**353.1**	**369.1**	**388.6**

A cash flow for the company for the period of the plan can now be projected.

	2010/11 ($'000)	2011/12 ($'000)	2012/13 ($'000)	2013/14 ($'000)	2014/15 ($'000)
Income	329.7	336.1	346.6	415.6	392.6
Expenditure	344.3	341.7	353.1	369.1	388.6
Surplus (Deficit)	(14.6)	(5.6)	(6.5)	46.5	4.0

Note 1. Cash on hand on 1 April 2010 of an estimated $60K will allow APFIP to operate a deficit budget for 2010/11, 2011/12, and 2012/13. The surplus in 2013/14 will fund the deficit in 2014/15.

ATTACHMENT 1: Activities to be used to promote the importance of Certification to the industry.

Aim: To raise awareness of, and create and maintain demand for, APFIP certified pome fruit propagating material.

Task	By Who/How	When	Target/Coverage
Articles/information	GM & EC, in industry magazine and newsletters	Continuous	Growers/All
Presentations	GM & EC at industry events	Continuous	Growers present
Brochure	GM & EC to be distributed at industry events	Continuous	Growers present
Website	GM & EC	Continuous	Growers/Licensees potential suppliers
Advertising	GM in consultation with Licensees, through industry magazines and newsletters	When product can be ordered from at least 50% of licensees	Growers/All
Education – Growers and Licensees	GM & EC, Future Orchards project, direct representation	Continuous	Growers present Licensees via specific visits
Trade Displays	GM & EC	APAL annual conference	Growers present
Trademark Launch	GM, Board Chair & Licensees	When sufficient product available (2010)	Growers/Licensees/all via reporting of event through industry publications/media
Annual Report	GM	Annually	Growers/All
Demonstration Sites	GM/ Licensed Nurseries to Provide	Trees on order for 2010	Growers in all regions via field days

14. 2015 APFIP Review by Dr Bryan Whan

AUSTRALIAN POME FRUIT IMPROVEMENT PROGRAM Limited 2011-16

Project AF11002

An Independent Review

undertaken by

Bryan Whan

Whan investments Pty Ltd

Report submitted May 2014

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1. OVERALL CONCLUSIONS

General

1. By the end of the current HAL project, the Australian Pome Fruit Improvement Program (APFIP) will have been operating for 20 years with an overall investment of just over $4.7m.

2. The program has been a great success, and those involved, including the industry leaders with the original foresight to initiate the program and the staff and management who have championed its cause, need to be congratulated. In particular, Garry Langford needs to be commended for his commitment and vision in leading the program since its inception. In a strategic context, the program has changed industry attitudes and provided direction in critical areas that were obvious limitations to the profitability of the apple and pear industries. The level of productivity of Australian growers was behind their international competitors, and this program has developed and implemented processes that will assist growers to close this gap by improving tree health through a certification scheme and delivering better varieties quicker through a variety evaluation system and improved quarantine.

3. The biggest challenges faced by APFIP were changing industry attitudes and encouraging the nurseries and growers to interact more effectively. Some industry attitudes were quite entrenched, and while it will take considerable time for the changes to be completely embraced by the industry, there have been significant improvements as a result of the APFIP initiatives.

Achievements and current status

4. The most significant, big-picture, achievements of APFIP have been the impacts on quarantine, variety evaluation and the certification of propagating material.

5. Quarantine

   New quarantine protocols and technologies have been introduced that have reduced the time required in quarantine for imported apples and pears from 4 years to 18 months.

   This objective has been accomplished, and requires a monitoring role only in the future.

6. Variety evaluation

   Variety observation trials have been established in each of the major production areas in Australia to assess potential new varieties from the breeding program in Australia and overseas. The major benefit of these trials has been to prevent growers planting new varieties that do not have potential in their region.

   The variety evaluation trials have largely benefited the breeding programs and variety owners, particularly in a period when some breeding was still being conducted in Departments of Agriculture. Growers have not obtained direct benefits to assist in their choice of varieties, because the trials involve only a few trees of a large number of potential varieties. The trials are also conducted under strict confidentiality where access and information is limited. In an environment where all the breeding will be conducted by commercial companies (the one remaining public apple breeding program will be commercialised soon), evaluation of breeding lines should become the responsibility of the breeding programs, rather than a scheme funded by grower levies.

   It would be appropriate to use levy funds to establish demonstration trials of a small number of varieties and potential varieties for the direct benefit of growers.

7. Certification

   A certification system for rootstock and trees has been implemented to enable growers to access new propagating material that is free of the important viruses, is true to type, and meets prescribed

standards. Virus-free parent material has been generated, and a certification process implemented through registered nurseries.

All the processes and material for an industry wide certification scheme are available, and the scheme should have a reasonable level of adoption by the end of the current HAL project in 2016.

Three aspects need to be continued to ensure the scheme is fully implemented and the industry gains the benefits of the efforts from the last 20 years.

- The generation of certifiable propagating material on an on-going basis in the future.
- Demonstrating the benefits of using certified material to the overall industry, and generating a demand from growers that will force all nurseries to provide certified trees and rootstocks.
- Monitoring and controlling the program to ensure all standards are maintained.

Future

8. After 20 years of operation, it is time for the future of APFIP to be re-assessed, strategically. While some work remains, a number of the major objectives have been achieved and the future role should focus more on ensuring the initiatives are adopted industry wide. APFIP will also be operating in a different commercial environment than in the first 20 years, as breeding is now being conducted by commercial breeding companies, varieties are being accessed globally, and marketing is integrally linked to the variety development. Some major players have considerable influence on the varieties and propagating material available to growers.

9. Some aspects of the future APFIP, such as the management of the certification system, may be able to be self-funded from commercial income derived from those activities, but other activities such as variety demonstration blocks for growers, may require support from a continued grower levy. It is unlikely that APFIP could generate adequate income from commercial activities to fund all future activities, and it could be argued that it is more relevant to use grower levies to fund initiatives that are for the direct benefit of growers.

2. RECOMMENDATIONS

Quarantine

1. APFIP activities on quarantine should be downgraded to a monitoring and liaison role through membership on the Post Entry Plant Industries Consultative Committee (PEPPIC). Future funding for this activity could be restricted to a small percentage of time for APFIP staff to be involved in the PEPPIC. In the event that an additional effort is required in the future to implement a special initiative, APFIP should seek additional funds from HAL for the specific task.

Evaluation

2. The national evaluation program involving large numbers of potential varieties in observation trials should be phased out as a public good operation by the end of the current project in 2016. In the future, all the breeding and evaluation should be undertaken by commercial companies, and evaluation of new breeding material should be the responsibility of these companies. Provision needs to be made for continuing existing trials until their contracts expire.

3. One evaluation site in the most important apple and pear growing region, the Goulbourn Valley in Victoria, should be maintained to evaluate promising material imported from overseas. This site, funded by grower levies, should be continued until there is confidence in the industry that the Australian breeding and commercialisation companies are accessing all the relevant material from overseas, and making it available to Australian growers. Once the breeding and commercialisation companies are undertaking this role satisfactorily, this site could also be phased out.

4. The observation trials should be replaced with demonstration blocks involving a few varieties that have been released or are near release. These blocks should involve a relatively large number of tress for each variety, around 25 to 50, that can be managed on a commercial basis. These demonstration blocks should be designed to encourage growers to personally inspect and assess the performance of new varieties so they can be sure of their performance before making decisions on new varieties to be adopted. These demonstration blocks should be the focus of field days and promotion. IP issues should be managed through appropriate confidentiality agreements for people visiting the sites. These demonstration blocks should be funded through the grower levies, on the basis of the benefits it provides to growers.

Certification

5. The certification component of APFIP should continue, to ensure the scheme is fully implemented and the benefits have been fully realised by growers. The whole effort could be lost if pressures to implement a whole of industry certification scheme are eased.

6. The following activities are recommended for the future to ensure the scheme is fully implemented industry wide.

   6.1. APFIP management should provide an ongoing role of monitoring and policing the certification system, until the process is broadly adopted by the nursery and orchard industries.

   6.2. Ensure adequate rootstock and trees are available to fully satisfy the demand for material for nurseries and growers. The perceived limitation of certified material not being available for all stock needs to be removed. If necessary, additional resources should be channelled into this activity immediately to ensure it can be achieved, as this criticism needs to be overcome.

   6.3. An active communication program needs to be implemented to demonstrate and communicate the benefits of the scheme to growers and the nursery industry. A major part of this communication program should be to create an environment where the recalcitrant nurseries are forced into offering high quality virus free material through demand from the growers. APFIP should develop a targeted communication program involving demonstration blocks, field days, publications, grower groups etc. The APFIP and APAL Boards should assist in this process.

6.4. The role of APFIP in assisting growers to access high quality trees of new varieties should continue, to assist in the broad adoption.

6.5. Certifiable material of new rootstocks and varieties needs to be produced, when they are released.

6.6. APFIP needs to work with the nurseries to ensure the process for tagging certified trees is acceptable to the nurseries, to ensure the greatest adoption of the system.

6.7. The certification system for pear rootstocks and trees needs to be fully developed and implemented.

7. The funding for the future certification component should be paid, where possible, from commercial income from the supply of certified propagating material. However, progress in achieving industry-wide adoption should not be constrained through lack of funding, and the likelihood of some levy funds being required to supplement the commercial funding in the short term needs to be considered and budgeted.

Support for new varieties and breeding programs

8. APFIP should not invest resources in trying to generate collaborations between commercial breeding companies in the future. Collaborations between breeding companies will be driven by business decisions in the future commercial environment.

Pears

9. Any future APFIP activities should include apples and pears, in the one project.

Commercialisation

10. The feasibility of establishing a business to operate a commercial evaluation trial network for breeding programs and variety owners should be assessed. Although it is recommended above that the current observation trials be phased out as a 'public good' operation, APFIP could establish a viable business to provide a commercial evaluation service for breeding programs and variety owners, on a profitable, commercial basis. The trial to evaluate international material, proposed in recommendation 3, and the operation of existing trials until their contracts expire could be undertaken by this business. In the future environment where all breeding will be conducted commercially, there will be a demand for variety evaluation across Australia, and it remains to be seen whether it will be more efficient for breeding programs to conduct these trials in-house or contract another business. An important consideration in assessing the feasibility of establishing an APFIP evaluation business would be whether this is consistent with the roles of the peak industry body and whether it should compete with the commercial sector if there is no market failure.

11. The feasibility of operating the certification business for apples and pears as a full commercial operation should be assessed and budgeted over the next 5 years. The reliance on HAL funds in the short and long terms should be quantified.

12. The reliance on HAL funds should be greatly reduced at the completion of the current project, as some components are terminated and commercial income increases. However, it is likely that some HAL funding should be maintained to ensure the overall objectives are finally achieved, and the benefits communicated. Further allocations of HAL funding should be based on the overall financial position of the APFIP company, and future HAL projects should be seamlessly integrated into the overall company objectives and budget.

Management

13. The reporting process needs to be improved, so the plans and progress are clear.

- The distinction between the activities of the company and the HAL project need to be reported clearly. The option of preparing one overall report for both that clearly outlines the different activities should be considered.
- Progress reports need to be more substantial to outline progress towards achieving the overall, long-term objectives as well as the short-term milestones.
- Progress reports should contain adequate information to convey the progress achieved without the reader having to undertake considerable background research.

14. The human resources skills required for the short and long term futures of the project needs to be assessed, given that there will be a change from mainly technical issues to more communications and promotion.

Planning for the future

15. The APFIP Board and HAL managers should undertake a strategic planning process to define the vision for APFIP post 2016. This should be a strategic, not operational, exercise, and address the following issues:
    - The major industry limitations for the future.
    - The roles of the different industry sectors, and which ones are leading and which ones are constraining progress.
    - The original objectives that have been completed.
    - Aspects that require further work, and the processes required to change industry attitudes and achieve a greater understanding and adoption of the APFIP initiatives.
    - The feasibility of operating evaluation and certification activities as commercial businesses, and the extent to which HAL funds and grower levies may need to supplement funding to ensure the businesses are viable.
    - Map out the key principles for future operations that will form the basis of a new 5 year business plan for APFIP.

16. The following timeline is proposed to enable the required planning to be undertaken before the end of the current project:

• June – August 2014	Review considered and actions considered.
• Jan – April 2015	Strategic planning process.
• June 2015	Budgets prepared for overall APFIP business and components. Clarify predicted commercial income and HAL funds required. Commence move to new business operations.
• Feb 2016	New HAL project developed for new 'public good' components. ○ Variety demonstration blocks. ○ Trial to evaluate international imported varieties. ○ Transition funding to enable current evaluation trials to be concluded according to their contracts. ○ Supplementary funds for aspects of certification business e.g. pears.
• 30 June 2016	Current project AF11002 completed.

3. BACKGROUND TO REVIEW

The Australian Pome Fruit Improvement Program Limited (APFIP) 2011-2016 is a project funded by HAL, and is undertaken by the Australian Pome Fruit Improvement Program Ltd., which is a not-for-profit company established by Apple and Pear Australia Limited for the benefit of the pome fruit industry in Australia.

Conducting a review of the project is a milestone that is required as part of the project proposal.

The purpose of the review is to give the APFIP Board, APAL and HAL confidence that the program is meeting its objectives, and to allow the APFIP operations to be fine-tuned if the review finds issues that need to be addressed. A requirement of the review is that it assesses all investments made in APFIP in both apples and pears. It should also assess the structure and the industry benefits of the program.

APFIP provides the Australian apple and pear industries with three main services:

1. Post entry quarantine
   Facilitation of the development and implementation of high security and efficient post-entry quarantine protocols for the prompt importation of new varieties and rootstocks.
2. Evaluation of apple and pear cultivars
   The provision of evaluation services, which generate independent and objective information about the regional performance of existing and new pome fruit cultivars.
3. Certification of rootstocks and trees
   The certification of high quality pome fruit rootstocks and nursery trees, and their promotion to the Australian industry.

The review will assess the progress achieved in each of these services, identify the benefits to industry, consider the potential for future benefits, analyse the investments since the inception of the program, assess the management structures, and suggest directions for the future of the program.

While the review is specifically related to the HAL project AF11002, it cannot be considered in isolation from the APFIP company. Hence, some aspects of the APFIP company, in particular the financial aspects and how HAL funds have been utilised, have been considered.

4. TERMS OF REFERENCE

The activities to be undertaken within this review will include:

a. MAP the total investment of each of the contributors in the APFIP program (including the present AP11002) since its inception in 1997.

b. Analyse the benefit of the APFIP program to the apple and pear industry, taking into account the anticipated business potential and timelines, assess any outcomes that may have resulted in either a reduction or an increase in expected industry uptake or utilisation of services and products.

c. Assess APFIP programs such as the utilisation of evaluation data and the certification scheme. Assess the total potential of the certification scheme and the expected timelines. Assess progress of the project against the set milestones/ project outcomes and the wider industry requirements

d. Assess the operational and structural efficiency of APFIP with a clear emphasis on the R&D activities. The context of APFIP's commercial operation to be included.

e. Identify whether levy and/or Australian Government funds should continue to be invested in this program because of existing and/or prolonged market failure.

f. Identify strategies required for the establishment of a self-sustaining operation, if any.

g. Assess if there are any commercial or other apple and pear breeding programs or related activities not aligned with the APFIP.

h. Assess any other industry needs that should be included in the APFIP program and a realistic future direction.

5. PROCESS FOR CONDUCTING THE REVIEW

1. An initial meeting with Alok Kumar and Garry Langford was conducted to plan the review and confirm the strategy.

2. Background information was assessed and analysed, critical issues identified, and the process for the review prepared.

3. Meetings were conducted with the APFIP Board, HAL management and APFIP management.

4. Meetings were conducted with the Department of Environment and Primary Industries regarding virus certification, and the Australian Quarantine and Inspection Service, regarding quarantine issues.

5. APFIP evaluation sites and certification nurseries were visited and co-operators consulted.
   - Goulbourn Valley, Victoria (4 co-operators)
   - Huon Valley, Tasmania (3 co-operators)
   - Adelaide Hills, SA (3 co-operators)
   - Manjimup, WA (3 co-operators)
   - Batlow NSW (1 co-operator)
   - Orange NSW 1 co-operator)
   - Stanthorpe Queensland (1 co-operator)

   The co-operators were consulted in person, except for those at Stanthorpe and Orange, who were contacted by phone.

6. A number of industry people, not directly involved in the APFIP program were consulted.

7. The Report was prepared and presented to the HAL and APFIP management.

Details of the consultation schedule and people consulted are contained in Appendix 1.

6. BACKGROUND TO APFIP

6.1 Vision

That the Australian Pome Fruit industry will benefit substantially from
- nursery trees, prepared from certified propagules, being in ready supply, and
- excellent technical information on new varieties.

6.2 Mission

1. To introduce prompt and secure access to new pome fruit varieties and rootstocks through efficient post entry quarantine protocols.
2. To develop and deliver to the Australian pome fruit industry independent and objective variety/rootstock information.
3. To promote and manage an efficient and effective certification scheme for the Australian pome fruit nursery industry.

6.3 Objectives

The broad aims of APFIP are:
- Improve growers' awareness of nursery tree options and help specify the trees they want – certified/non certified, rootstock, architecture.
- Empower growers in their negotiations with nurseries, particularly with respect to setting detailed specification of the tree requirements.

- Improve interactions between growers and nurseries.
- Promote value of certification to growers and nurseries.

The Australian Pome Fruit Improvement Program Ltd (APFIP) was established in February 1997 by the Australian Apple and Pear Growers Association (AAPGA, now APAL) for the benefit of the Australian pome fruit (apple and pear) industry. APFIP is a not-for-profit company with a Board of Directors who work in the pome fruit or nursery industries. It is managed by a General Manager. APFIP works co-operatively with all pome fruit industry sectors in Australia and has the following objectives:

- Facilitate an efficient entry into Australia of pome fruit propagation material with characteristics that will benefit the commercial potential for pome fruit production in Australia;
- Develop and promote independent evaluation of pome fruit propagation material for the pome fruit industry in Australia;
- Develop and promote standards for pome fruit propagation material that will assist the international competitiveness of the Australian pome fruit industry

Importance and relevance of objectives

Currently, commercial nurseries dominate both pome fruit tree production and the supply of information about the performance of new varieties. APFIP certified propagules meet world-class specifications and its evaluation program is more sophisticated and objective than similar programs overseas. However, APFIP must continue to develop its relationships with nurseries, variety owners and growers to change the dominant influence nurseries currently have on the standard of trees and information on new varieties. Failure to do this for commercial, political, or any other reasons will result in the nursery dominated status quo remaining.

Secure and rapid post entry quarantine procedures directly impacts on the profitability of all growers by reducing the occurrence of deliberate, illegal imports and the associated risk of exotic pests and diseases.

6.4 History

- Australian Apple and Pear Growers Association agreed in 1994 to establish the Australian Pome Fruit Improvement Program (APFIP), and to collect a levy to fund the program.
- The Australian Pome Fruit Improvement Program (APFIP) was established as a company limited by guarantee in 1996 by the Australian Apple and Pear Growers Association, now Apple and Pear Australia Limited (APAL).
- The specific levy to fund APFIP was implemented in 1995 – set at 1.5cents per 18kg carton of fresh apples. The levy was reduced in 2002 to 1.0 cents per 18kg carton. The levy is currently calculated at the rate of 0.055 cents per kilogram.
- A National Coordinator was appointed in 1996, and this role was changed to General Manager in 2005.
- The company now has two employees – a part-time General Manager, and a full-time Evaluation Coordinator.
- Although the original intention was to include activities on accessing, multiplying and supplying budwood and rootstocks, resistance from the nursery industry forced these objectives to be dropped in 1999, and the program concentrated on three objectives of:
    - developing and promoting certification standards
    - evaluating varieties and rootstocks in different growing regions
    - facilitating and promoting efficient quarantine standards.

  APFIP retained the right to seek and acquire rootstocks and varieties on an opportunistic basis.
- The activities were separated into R&D and Commercial in 2000 to ensure the company maintained its focus on commercial outcomes.

6.5 HAL projects

APFIP is principally funded through the special levy which is administered by HAL. These levy funds are matched from HAL funds provided by the Australian Government. APFIP generates some additional funds from commercial activities.

HAL has supported APFIP through five projects since the inception of the program in 1997.

Project ID	Commencement date	Completion date
AP96035	1 July 1997	30 June 2000
AP00026	31 Aug 2000	31 July 2005
AP05017	1 July 2005	31 May 2010
AF10000	1 Oct 2010	30 June 2011
AF11002	15 Aug 2011	30 June 2016

AF10000 was a one year proposal, requested by the Apple and Pear IAC, to continue the work while APAL conducted a review of the industry's breeding, evaluation and variety commercialisation procedures.

The current operations are guided by the APFIP Business Plan 2010-15.

This current review has been commissioned to assess the current HAL project AF11002, but information in the previous projects has been considered in making assessments.

7. REVIEW ASSESSMENT AND FINDINGS

7.1 Broad objectives for the current business plan and project

The broad objectives, strategies and tactics for APFIP, for the current business plan and project are:

1. Continue to promote the APFIP certification trademark to the Australian pome fruit industry, in particular through promotion of the value of certified rootstocks and nursery trees.
2. License nurseries to use the APFIP certification trademark.
3. Operate an effective and efficient independent variety evaluation enterprise.
4. Build relationships with nurseries so that they use these services and become an efficient means of distribution of high quality products to industry.
5. Grow the APFIP enterprise and the relationships with nurseries, breeders and variety owners both in Australia and overseas to such an extent that APFIP products and services become the natural first choice in the Australian pome fruit industry.

Assessment of the project and findings from the review will be discussed according to the main activities:

- Quarantine
- Evaluation
- Certification
- Support for new varieties and breeding programs
- Pears
- Commercialisation
- Management
- Analysis of investments

8. Quarantine

APFIP's role is to liaise with the Australian Quarantine Inspection Service (AQIS) to:

1. make sure the industry is adequately protected from exotic diseases, and
2. that Australia's international competitiveness is not reduced by overly long post entry quarantine periods.

8.1 Objective of current project

Facilitate research into new pathogen testing techniques that may further shorten the post entry quarantine time.

This will be achieved by building on the good relationships with AQIS, developing relationships with international quarantine agencies, and reviewing and modifying the virus testing and elimination system.

8.2 Target outputs and milestones

Target outputs – current project proposal

1. Adoption of the recommendations from the Beale Report as they apply to the quarantine of apples and pears.
2. Provide ongoing access to high security plant quarantine services for importations of new pome fruit varieties and rootstocks into Australia.

Milestones – current project proposal

1. Report prepared of the activities of the Post Entry Plant Industries Consultative Committee (PEPPIC) activities for the previous 12 months.
2. Report prepared of other quarantine issues addressed in the previous 12 months.

8.3 Progress

1. APFIP has worked with AQIS to implement a number of improvements to the Post Entry Quarantine protocols, and these will lead to significant benefits to the apple and pears industries.

2. In the period up to 1998 it took a minimum of 3 to 4 years to introduce a new variety into Australia. A review of the protocols for the importation of bud wood was undertaken in 1998, and the General Manager of APFIP played a key role in urging AQIS to undertake this review. These new protocols were adopted by AQIS in 2002, 4 years later. Two important policies implemented were:
   - the ability to have testing completed outside the quarantine station, and
   - the ability to implement new tests for the identified exotic diseases once they were verified, without the need for further review of the testing protocols.

3. The new post entry quarantine protocols are well-established and new varieties and rootstocks now only take 15 to 18 months to pass through quarantine instead of 4 years under the former protocols. The new protocols utilize viroid and fire blight tests developed under a HAL project that was partly funded by APFIP.

4. The APFIP General Manager had a position on the Post Entry Plant Industries Consultative Committee (PEPICC) of AQIS, but this role is now undertaken by the Evaluation Coordinator. The PEPICC advises AQIS on quarantine matters, so this is an important role to maintain contact and influence AQIS on issues that affect pome fruit imports.

5. The role of APFIP in influencing AQIS to implement these new protocols is well recognized by growers, the broader apple and pear industries, and AQIS. It is widely acknowledged that this progress would not have been achieved without the persistence of the General Manager of APFIP, Garry Langford.

6. APFIP has delivered ten new apple varieties from post entry quarantine into the APFIP evaluation system. One apple and a Quince rootstock have been imported into quarantine recently.

7. A current issue that needs attention is the development of the new DAFF post entry quarantine site at Attwood, near the Melbourne airport, in 2015. Knoxfield will close down in 2016, as part of a policy by DAFF to establish a few major quarantine centres with good resources and technologies, and close down a number of current facilities.

8.4 Benefits to industry

The new protocols have delivered significant benefits to growers and the apple and pear industries by providing a more secure and rapid post entry quarantine service.

1. Growers have access to new varieties much quicker, which impacts on their profitability.
2. The industry is able to compete more effectively with overseas competitors because new varieties can be adopted more quickly.

3. There has been more interest from overseas variety owners to consider commercialisation in Australia because constraints on quarantine have been eased.
4. The threat to the industry of the introduction of exotic pests and diseases has been reduced.
5. Being able to implement new testing procedures without the need for undertaking a complex AQIS review has created a more efficient and less costly process.
6. The ability to use different quarantine stations and testing agencies is more efficient than each quarantine station having to gear up to complete all the required testing.
7. The direct involvement of APFIP in the Post Entry Plant Industries Consultative Committee provides an insurance that the rigour of quarantine is maintained, and that immediate action is possible if there ever is an outbreak of an exotic disease.
8. Preventing exotic diseases entering Australia provides significant benefits to the industry e.g. an ABARE study concluded that the introduction of fire blight into Australia would make the apple industry a marginal exercise. The new techniques to detect fire blight offer far greater protection from the introduction of this disease than the previous systems.
9. Two future technologies could further improve the efficiency of post entry quarantine and reduce the time required. Deep Sequencing Genomics is being investigated as a project in the Plant Biosecurity CRC to identify the presence of viruses and viroids in the DNA of trees. The option of grafting bud wood onto rootstock at the registered premises of a variety owner is being considered.

8.5 Conclusions

1. The APFIP activities on quarantine of pome fruits has been tremendously successful, and is widely appreciated by industry leaders. Reducing the time required in post entry quarantine has brought significant benefits to the industry through quicker and broader uptake of new varieties. This achievement was largely due to the role Garry Langford played as the champion of this cause, and getting AQIS to act was due to his persistence.

2. The tasks of improving the technologies used in quarantine, and reducing the time required in post entry quarantine, have largely been completed.

3. Future activities should involve a monitoring role, and this can be achieved through membership of the Post Entry Plant Industries Consultative Committee (PEPPIC). Any special issues such as the adoption of new technologies or the outbreak of a serious disease could be dealt with when they arise on a case by case basis.

9. Evaluation

9.1 Objective of current project

To have the major nurseries and all Australian-based pome fruit breeding programs continuing to use APFIP as the regional evaluation program of choice.

This will be achieved by:
- Building strong relationships with Australian public breeding agencies.
- Building strong relationships with major Australian nurseries.
- Developing relationships with international variety managers and breeding programs.
- Maintaining the quality of evaluation by growers, Agriculture Departments, consultants etc. continuing to be involved in evaluation.

9.2 Target outputs and milestones

Target outputs – current project proposal

1. Delivery of a high quality variety and rootstock evaluation service for the Australian apple and pear industry which, during the project, will continue evaluation of 57 apple varieties and 40 pear varieties, and commence evaluation of about 35 new apple varieties and 25 new pear varieties.
2. Involve the major nurseries and variety owners, with the following aims:
   - Each major nursery to have entered into an evaluation agreement with APFIP by 2015.

- 80% of all new pome fruit varieties to be entered in the APFIP evaluation program.
- At least one new evaluation agreement with a new variety owner/manager in each year, making 5 new owners/managers contracted to APFIP by 2015.

3. Delivery of an annual, public domain, Variety Evaluation Report. This will detail the selections numbers/names of the varieties in the evaluation system, the supplier of the variety, where the variety has been evaluated, current status in the system, and if information is available from APFIP or the supplier.
4. Deliver annual variety showcases in all main apple and pear production regions across Australia, and deliver a variety showcase to the apple and pear annual conference in the years that the conference is held.
5. Design, manage and execute an apple dwarfing root stock trial in two regions, and report on results achieved.

Milestones – current project proposal

1. Regional and Conference Variety Showcases completed in each year.
2. Regional evaluation blocks planted each year and brief reports of planting details prepared.
3. Variety Evaluation Reports prepared for previous season.
4. Root stock trial planted in 2012. A brief report prepared and disseminated to relevant bodies (DPI's, nurseries, article in Australian Fruit Grower).
5. Data from apple rootstock trial collected for season 2012-13, and a high level summary report of progress prepared.

9.3 Progress

The APFIP variety evaluation network was established to provide an independent assessment of future varieties to variety owners and growers. Providing this service was deemed necessary once the various State Departments of Primary Industries terminated their breeding and evaluation activities with the advent of plant breeders' rights. Some major variety owners and large growers conduct their own variety trials, but they are limited in the regions they cover and they cannot be regarded as being independent.

The APFIP evaluation system has been established with the following features.

- The germplasm, and the information generated are secure, to abide by the PBR and patent requirements of the material.
- Entries in the trial are coded, so co-operators and growers are not aware of the variety names or owners.
- The public does not have access to the sites, and evaluation groups sign agreements that include confidentiality and non-propagation conditions.
- The trials are conducted on the properties of Regional Custodians, and are managed as part of normal orchard operations to reflect commercial conditions.
- Grower involvement is achieved through Regional Evaluation Groups, composed of local growers and the data collector.
- Varieties remain in the trial for a maximum of 7 years, although owners may nominate to have entries removed before that time.
- The rootstock MM106 is the standard rootstock for all sites. The rootstocks M26 and M9 are also used.
- APFIP contracts site observers in each location to collect the data required and to enter them into the database. An observer's manual has been prepared to ensure information is collected on a consistent basis.
- Information is stored in a secure internet database with controlled access – https://evaluation.apfip.com.au/. Variety owners can access information using a password.
- Once a minimum of 3 years data have been collected at one site the opportunity exists to make the data available to growers with the approval of the variety owner. This information is available online at www.apfip.com.au using only the variety name. This system ensures anonymity and gives a high degree of security to the varieties.
- Variety owners pay to enter varieties.
- A public Variety Evaluation Report is produced each year which includes a register of all the varieties that have been through the system, but confidential information is not disclosed. Industry is provided with an annual report on a selection of varieties that have completed evaluation through the Australian Fruitgrower magazine.

- Fruit of the varieties in the program are showcased in the regions in May/June each year, as well as the APAL conferences when they are held.

Tree material tested
- There have been 131 apple and 66 pear cultivars evaluated since the program was commenced.
- During the 2011/12 year, APFIP continued evaluation for 37 apple varieties and 39 pear varieties at seven national evaluation sites (one in each major growing region).
- It is anticipated 7 lines, on average, will be added to the trial over the next 5 years.
- The new lines and varieties are evaluated at 9 regional sites.
    - South Australia – Lenswood (2)
    - NSW – Orange and Batlow
    - Queensland – Stanthorpe
    - Tasmania – Huonville
    - Western Australia – Manjimup
    - Victoria – Shepparton (2)
- A total of about 600 to 1200 tress are grown in the trials, depending on the year and owner requirements.
- Twelve rootstocks are being evaluated under two scion varieties (Cripps Pink and Gala) in a trial at three sites in major production regions to identify those most suited to Australian production regions. This trial was planted in 2012.
- Breeding lines have been evaluated for 27 variety owners since the trials began. Apple and pear breeding lines are currently being evaluated for ANFIC NSW, ANFIC NSW PreVar, Bill Shields NSW, C&O Nurseries USA, DAFWA, FENO, Better3Fruits, Coregeo, Horticulture Research ANFIC, and Naktuinbow. All the major nurseries, except Graham's Factree, have entered into evaluation agreements. This included the ANFIC group of nurseries, which along with Tahune Fields and Tangara nurseries, make up the major share of Australian nursery tree production. Montague Fresh is a large variety manager that makes commercialisation decisions as part of an international strategy, so has not been involved in the APFIP evaluation process.
- Three levels of evaluation were implemented in 2012 and 2013
    - Snapshot - 2 trees per plot
    - Standard - 6 trees per plot
    - Commercial - 50-100 trees per plot. The commercial evaluation blocks are an additional commercial service provided to variety owners such as DPI Vic and Prevar.
- Prevar and Coregeo varieties, including the DFEPI Vic pear variety, were evaluated in commercial blocks.

Promotion – ensure access to evaluation information
- Articles have been published regularly on the evaluation of varieties in the Australian FruitGrower.
- Publications on evaluation information are being prepared externally by APAL staff, including the communications manager, Sarah Kulman.

Evaluation products for various customers
- APFIP has developed a range of evaluation products to offer to its evaluation customers.
- Customers wanting evaluation services are generally variety owners (or parties holding the Australian rights to a variety) that come to APFIP to use the evaluation service prior to developing commercial agreements in Australia. These groups are seeking independent performance data to use in the commercialisation process for the variety.

9.4 Benefits to industry

1. The APFIP evaluation program provides an independent assessment of apples and pears in the major fruit growing regions of Australia. This evaluation provides information to make balanced decisions on the best varieties for each region.

2. While identifying the varieties that perform well in the different regions, a much greater benefit is identifying those varieties that perform poorly, saving growers from the considerable expense of establishing new areas of a variety that will not be profitable.

3. A major benefit of the APFIP evaluation is its independence, a significant feature in the current environment where almost all varieties are being delivered through commercial enterprises that are driven by achieving large market shares and profits.

9.5 Conclusions

1. The APFIP evaluation system has provided an independent evaluation of potential new varieties in the major fruit growing regions of Australia. While this evaluation may give growers a look at good new varieties that may be released in the near future, the biggest value from the scheme is in identifying varieties that are not suitable and would cause growers to lose money if they adopted them. This has been a problem in the past when nurseries have been biased in promoting their varieties which did not perform as claimed.

2. Having an independent system is valuable only if everyone participates, but unfortunately, two of the largest variety owners, Graham's Factree and Montagues have not participated in the APFIP evaluation system.

3. Having an independent evaluation system run by APFIP was justified when the varieties were developed under a public breeding model, as all varieties were freely available. However, the situation is now different as the majority of apple and pear varieties are developed under a commercial model where varieties are protected and the owners seek a profitable income.

4. In the current commercial environment, there is confusion about who is the main target client for the evaluation system. Is it the grower or the owner? Various objectives in the relevant project proposals and business plans indicate both groups are targeted, but in most reporting and discussion it is the grower who is assumed to be the major beneficiary. Yet the trial is operated with a reasonable number of new lines, each with a small number of trees, with confidentiality arrangements and restricted access which means that it is really only the owners that benefit.

5. Growers are not making use of the data, and in most situations growers are not aware of the existence of the trial in their area. This is partly due to the restricted access and confidentiality placed on the sites and data, but it is also due to the small number of trees used for each variety and the relatively large number of entries. Some co-operators are familiar with the type of material in the trial, but there are few examples where even the co-operators indicated they had used the actual information to make decisions on new varieties. The Regional Committees do not seem to be working with interest. It is difficult to see how growers can use these sites directly when they cannot visit or access the data.

6. The evaluation sites are really for the benefit of the variety owners, who see them as a cheap way of extending their testing network. They consider the data valuable, but sites need to be visited as well, to gain the best value. These sites are regarded as observation sites for preliminary purposes, which are used to check original assessments in different regions. Advanced lines need to be tested in large blocks.

7. The critical question is what is the most appropriate process for evaluating new varieties in the future to provide growers with sound advice and ensure they are not adopting inferior varieties that are being marketing inappropriately? The future breeding environment will be characterised by commercial companies either breeding new varieties or accessing new varieties from overseas, with no varieties being developed through public breeding organisations. The trend will also be for variety owners to link their new varieties to market strategies to give them an advantage and make them profitable for growers.

8. Under this commercial breeding environment, it is difficult to argue for growers' levies to be used to select breeding material for private companies which will seek profits. Growers should not have to sort out large numbers of varieties, the majority of which are rubbish; this is the role of the breeder/owner. However, it could be justified to use levies to demonstrate to growers the performance of varieties that have been released or are close to release. This is a demonstration phase rather than a selection phase as in the current system.

9. There is a need for large demonstration blocks that compare a few of the latest varieties or potential varieties in each region. These should be designed so growers can inspect them first hand through field days or individual visits. The need for this was a very strong and consistent view conveyed by growers. Confidentiality may need to be considered for these sites to ensure requirements for patents and PBR are not compromised, but this can be managed by implementing appropriate confidentiality agreements. Similarly the risk of theft can be overcome to some extent by making it clear that DNA tests can be used to identify any illegal growing of material.

10. A new role undertaken by APFIP in recent years has been to facilitate the introduction of new varieties from overseas, and encourage overseas breeding programs to consider Australia as an opportunity for commercialisation. The question needs to be asked whether, in an environment where breeding is now virtually operated by commercial companies, this should continue to be a role for APFIP in the future. The major Australian breeding and commercialisation companies are also being very proactive in establishing arrangements with international breeding programs to access the best potential varieties for Australia. So, is there market failure in this area, and should grower levies be used to fund this component of APFIP? If grower levies are used to import new varieties, should they be provided to all Australian breeding and commercialisation companies or be commercialised by APFIP? The following conclusions are drawn.
    - There is a continuing role for APFIP in importing new varieties from overseas, using grower levies, if it can be demonstrated that valuable material is not being accessed and made available to Australian growers by the breeding and commercialisation companies.
    - If the Australian breeding and commercialisation companies are being successful in accessing the best material from overseas, then it is difficult to justify the use of grower levies to duplicate this effort.
    - The APFIP company and APAL may have reasons to be involved in accessing international varieties, using their own funds, purely as a business venture. In this case they may be competing with the breeding and commercial companies.

10. Certification

APFIP introduced an Australian certification system for the propagation of fruit trees following extensive consultation in Australia and evaluation of European certification systems. This system operates under a certification Trade Mark, and APFIP licenses the use of this Trade Mark to producers of nursery trees and rootstocks.

Viruses of economic significance are widespread in Australian orchards. Using certified propagating material which is tested negative for known viruses can result in up to 20 per cent increase in orchard productivity.

Note: The term 'virus-free' is used loosely in general discussions and writing, but technically nothing can be determined as virus free, and the correct term should be 'virus tested negative for specific viruses'. However, the term 'virus-free' will be used in this report for simplicity and to provide a greater understanding by readers.

10.1 Objectives of current project

Tree propagule (rootstock and scion) certification systems which help protect the Australian industry from the losses associated with viruses.

Specifically:

1. By June 2015, 50% of Australia's pome fruit rootstocks and nursery trees will be produced using propagules certified by APFIP.
2. By June 2015, 70%of growers enquiring to nurseries for trees will request trees propagated with propagules certified by APFIP.

This will be achieved by:
1. Providing sufficient APFIP-certified rootstocks and varieties.
2. Promoting the benefits of using APFIP-certified nursery trees and rootstocks.

3. Modifying protocols for virus elimination and virus testing as needed to keep them current and state of the art e.g. to include new viruses using the lowest possible detection limits.

The increased certification income will allow the APFIP levy to be reduced by one third in the period 2010 to 2015 - from 0.055 cents/kg to 0.037 cents/kg.

10.2 Target outputs and milestones

Target outputs – current project proposal

1. Continue to promote the value of certification to the industry so growers understand the real financial benefits of certified trees and make the investment to plant them.
2. Complete trace back capability for APFIP-certified trees via uniquely numbered APFIP Tree Tags and the certified tree database - to be rolled out to all nurseries producing APFIP-certified trees under this project.
3. Further develop the APFIP tree procurement scheme aimed at providing an effective interface between growers and nurseries.
4. Plant, manage, collect data, analyse and report growth, yield and fruit quality data from four certification demonstration sites comparing certified trees vs trees from non-certified sources.
5. Develop the Repository as infrastructure support for the evaluation and certification programs.

Milestones – current project proposal

1. Certification demonstration sites planted each year.
2. An article on results and progress of the demonstration sites published in Australian Fruit Grower, each year
3. A high level summary report on the progress with the certification demonstration blocks prepared each year.
4. A report on activities of the tree Procurement Service prepared each year.
5. A report on the number of tree tags issued in the previous 12 months prepared each year.
6. Bird netting for the repository erected, and new equipment purchased in 2012.
7. Develop capability of the repository to:
    - produce up to 10,000 rootstocks per year
    - provide a secure repository for varieties undergoing commercialisation (e.g. Kalei)
    - the production of budwood.

10.3 Progress

Certification Trade Mark

- APFIP has established guidelines for the production and maintenance of certified propagation material and has registered a trademark to be used to identify material produced under this system. This trademark will be licensed to existing businesses that adopt and maintain their propagation systems according to the guidelines. The trademark approach is similar to systems operating in other countries such as France and The Netherlands.
- The Trade Mark will be displayed on the nursery tree tag with one tag for each certified nursery tree. In the case of rootstocks there will be one tag for every bundle of 50 certified rootstocks.
- APFIP will collect a Trade Mark fee for each tag used. APFIP aims to license the use of the certification Trade Mark to producers of nursery trees and rootstocks that meet the Trade Mark requirements.
- Over the next five years the focus will be on licensing nurseries to use the certification Trade Mark. Under this agreement the licensee must use the certification mark on all the trees it propagates that meet the trade mark standards.

Adoption of Certification

- APFIP's certification scheme, as witnessed by its Certification Trade Mark, is now used by eight nurseries that together propagate 65 per cent of the Australian apple and pear trees:
    - Tahune Fields Nursery, Tasmania (ANFIC member)
    - Tangara Nursery, Tasmania
    - Balhannah Nursery, South Australia (ANFIC member)
    - Olea Nursery, Western Australia (ANFIC member)

    - Little Tree Company, Victoria (ANFIC member)
    - Galgate Nursery, Victoria
    - Mount View Nursery, New South Wales (ANFIC member)
    - Topstock Investments Nursery, Victoria
- Tahune Field Nursery now only produces certified trees.
- Individual growers who grow their own trees have also requested APFIP to become licensees, so they can get access to certified material for production of their trees.
    - Lenne Orchards, Victoria
    - Top-Qual Orchards, Tasmania
    - Hansen Orchards, Tasmania
- In 2012, 245,000 stocks of certified stock and budwood were produced, representing more than 40 per cent of Australia's rootstock requirements. The level of overall adoption has been restricted due to the availability of finished certified trees. While certified rootstock is now in excess of 500,000 harvested stock per annum, the limiting factor has been the availability of certified budwood of current commercial varieties.

Demonstration of value of certification

- The value of certified nursery trees is being promoted through the establishment of demonstration sites on grower's properties. Trees certified as testing negative for the viruses of economic significance are being compared to non-certified trees of the same variety and rootstock planted in an adjacent block. Financial benefits and a benefit:cost analysis will be calculated.
- Four demonstration blocks were planted in 2012 and 2013, in the Yarra Valley in Victoria, Lenswood SA, Huon Valley in Tasmania, and Stanthorpe in Queensland. Unfortunately, the trees at the Yarra Valley site have been shown to be infected with a virus so is of no value as a demonstration site.
- Annual field days will be held at each site, and results reported annually in the Australian Fruit Grower magazine.
- The benefits of certification are being promoted through the Certification Scheme Promotion Plan, which involves articles, presentations, brochures, a website, advertising, grower education events, trade displays and demonstration sites.

Establishment of techniques to eliminate viruses

- Viruses can be eliminated by the use of heat treatment. APFIP has established a heat treatment process in conjunction with the DEPI Crop Health Services and the AQIS plant quarantine station at Knoxfield. Indexing protocols have been established by Crop Health Services.
- Virus testing can be conducted on imported material while in quarantine. Importers need to manage the new material once it is released in accordance with the certification system to ensure it meets the certification requirements.

Trueness to type and meeting specifications

- Minimum nursery tree standards are included in the certification system. Varieties and rootstocks to be entered into the certification system are assessed for trueness to type by APFIP once the trees are fruiting.
- APFIP has developed a nursery tree description and specifications that detail the ideal requirements, and are aimed at helping growers to purchase nursery trees that suit their purpose.
- Advocating specifications for propagating material has resulted in a complete change of the nature of nursery trees delivered over the last 10 years.

Tree Procurement Scheme

The aim of this scheme, which commenced in 2010, is to provide an effective interface between growers and nurseries so growers can access high quality trees of the desired variety.

- It provides a national tree procurement service for growers in all growing regions, where APFIP provides information to growers on where to source trees to meet their requirements, using certified trees if possible. It then assists in the communications with the nurseries and provides oversight in the production of the trees by the nursery.

Trace back of certified propagules

- This system provides the ability to trace back the history on all trees that carry the APFIP certification trade mark, including virus status, trueness to type, and location of all certified material during production.
- The database prints a unique tree tag number onto each APFIP controlled tree tag.

- This system was trialled in 2010-11 with two Tasmanian nurseries, and introduced generally in 2012.

The APFIP Repository

- The APFIP repository site at Cambridge, in southern Tasmania, has been netted to protect the valuable germplasm.
- The repository was moved from Monash, in South Australia, to Cambridge in 2005, as the climate is less stressful and it is isolated from pome fruit production areas.
- APFIP was appointed by Coregeo to produce certified budwood of RS103-130, ANP-0118 and ANP0131 for supply to nurseries and growers for grafting, in 2012.
- Budwood has been planted in 2012 and 2013 for grafting by nurseries and growers, including apple and pear varieties from Coregeo and DAFWA.
- All major nurseries have now been licensed to use the APFIP M9 and M26 rootstocks each year. Sanders has signed a test agreement to trial NAKB®T337M9.

10.4 Benefits to industry

1. A low level of plant health has been one reason why the Australian industry has never been able to match the yield per hectare of our major competitors.

2. The APFIP certification system provides benefits to orchardists and nurseries in two ways by providing varieties and rootstocks that are:
   - Tested negative for apple stem pitting virus, apple stem grooving virus, apple mosaic virus and apple chlorotic leaf spot virus, and
   - True to type, and meets the specification standards for nursery trees and rootstocks.

3. Using propagating material free from known viruses helps protect the Australian industry from the losses associated with viruses. Viruses of economic significance are widespread in Australian orchards and cause significant production losses. The much-quoted study of Penrose, Davis and Valentine in 1988 demonstrated that virus tested trees out-yielded infected trees by 40 to 56 per cent, although not all of this effect may have been directly due to the viruses. However, it is general acknowledged throughout the industry that using certified propagating material free from known viruses can result in up to 20 per cent increase in orchard productivity.

4. Trees produced from APFIP-certified propagules are higher yielding and fruit earlier than non-certified material, a major 'free' bonus for growers buying such trees. High quality certified trees will come into production quicker. A number of growers recognise that clean trees improved profitability through a higher pack-out, and they rate this benefit equally, or more, important than straight out production. Clean trees are more uniform for colour etc.

5. Having uniformity throughout the orchard is an essential requirement to be able to implement new techniques that will increase production and reduce costs through more efficient pruning and picking operations. Some farmers regard this as a critical benefit of using certified propagating material.

10.5 Conclusions

The need for certification

1. The need for an Australia-wide system that certifies propagating material as being free of the viruses of economic importance, true to type and meeting specification standards is clear. Every beneficial character is expressed in the nursery tree. Australia is behind the rest of the world in achieving standards for propagating material, and this has put Australian industries at a disadvantage to its competitors due to lower yields and higher input costs. All propagating material in Europe is virus free, a result of a certification system that is legislated.

2. The nature of the industry in Australia means that orchardists have been at the mercy of the nurseries in sourcing high quality, uniform propagating material that is free from the important viruses. There is clearly a big range of attitudes amongst nurseries, and there has been a significant shift in attitudes as a result of the APFIP initiative. However, many growers still convey experiences where they have not been satisfied with the quality of material provided by the nurseries – trees not on the correct rootstock, uneven material, trees too small, trees not of the correct variety, material

infected with viruses, desired rootstocks and varieties not being available etc. Growers gave examples where they had to pull out thousands of trees and replant due to poor nursery material, resulting in two years of lost production worth hundreds of thousands of dollars. One grower decided to grow his own rootstock material due to a shortage from the nurseries. One grower who was losing 25-30 per cent of production through mosaic virus was informed by a major nursery that growers did not need virus free rootstock.

3. As the viruses that affect pome fruit can only be distributed by grafting and budding using infected material, it is obvious that the rootstock and budwood must both be certified for the resultant trees to be certified. It takes only 10 days for viruses to infect clean material once infected material is budded or grafted.

Delays in getting certifiable material

4. There has been some frustration by growers and APFIP personnel at the time taken to clean up rootstocks and trees, and this has been seen by some as a failing of APFIP. However, this has been a major challenge which has not only required producing clean material but also changing the whole mind set and culture of the industry. Implementing a voluntary system is much more difficult than if the system had been legislated, as was the case overseas.

Adoption attitudes

5. Growers and nurseries have a range of attitudes on the value of certification, and the degree it should be implemented.

6. Most acknowledge the value of virus free root stock and trees, and agree this is the ultimate aim, if it is achievable. Growers would prefer virus-free material, but this is often not an option provided by nurseries. The most progressive nurseries are now producing all virus free material, and others are aiming to achieve this over the next few years. However, many other nurseries do not aim for this objective. Some consider that growers don't need virus free material and others acknowledge that virus free rootstock is important but believe it is not necessary for bud wood, as long as it is healthy.

7. In considering the virus status of nursery material, growers need to be aware whether claims of material being virus free refer to only quarantinable viruses or all the viruses of economic significance. More information should be provided on the actual viruses for which tests have been conducted.

8. There is a distinction between virus free material and fully certified material. Some nurseries claim they provided virus free material, as indicated by virus testing, but are not certifying it. Nurseries justified their stance by saying that growers did not demand certified material.

9. Some nurseries considered the costs of certification were high, and growers would not pay the additional charge of around 50 cents. Other nurseries indicated there had been no reluctance by growers to pay the certification costs. A number of growers are very supportive of certification and indicated the additional costs of certification were outweighed by the benefits. This additional cost could be regarded as quite insignificant when compared to loss in production and the massive costs of re-planting large orchard areas due to poor propagating material. Similarly, the cost of certification is low compared to the delivery costs. The acceptance of certification and the associated costs will increase once growers see the benefits first hand.

10. The short term limitation to the adoption of certification has been the lack of adequate certifiable material, and this should not be an issue in the next few years.

11. The long term limitation is going to be the dominance the nurseries have on governing the varieties growers can access and providing the option for certifiable material. This will be a major challenge to address. The nurseries having the greatest impact area:
    a) Fleming's nursery/Graham's Factree (Victoria)
       Has 20 per cent market share of apple propagating material, and has an aggressive approach with growers. Fleming has sole rights to many varieties, so growers have no other options if they

require those varieties. Fleming material carries a Virus Tested tick, but it is for quarantinable viruses only.

b) Australian Nurserymen's Fruit Improvement Co (ANFIC)
Has 50 per cent apple market share, with the following member nurseries.
- Balhannah Nurseries (SA)
- Birdwood Nursery (Qld)
- D&Y Pike Pty Ltd (Vic)
- JFT Nurseries (Vic)
- Forest Home Nurseries (Tas)
- Little Tree Company (Vic)
- Mount View Orchards Batlow (NSW)
- Narromine Transplants(NSW)
- Olea Nurseries (WA)
- Sunraysia Nurseries (NSW)
- Tahune Fields Nursery (Tas)
- WA Shepherd & Sons (Vic)

c) Tangara Nursery (Tasmania)
Has 15 % apple market share.

d) Other nurseries
Have 15% market share.

With the exception of Tahune and Tangara, which are two of the strongest supporters of the APFIP certification system, these nurseries are generally not involved in the certification system, quoting the increased costs as the major reason.

12. 'Montagues Fresh' procure and distribute apples and pears, and differentiates its business from competitors by accessing and developing new varieties. Montagues has built partnerships with plant breeding organisations such as PreVar in NZ, Sunworld in USA, PSB in Spain, Bradford Farms in USA and PICO in Canada. It has exclusive marketing rights to some varieties such as Jazz, Eve, and Smitten apples. Due to its size, Montagues Fresh can have a significant impact on APFIP's vision of achieving certified stock throughout the industry. It does not produce nursery trees, but uses nurseries to generate plant material of their varieties. While it was not possible to assess what percentage of their material comes from nurseries licensed to use the APFIP certification trade mark, it is anticipated this percentage is quite high.

Certification tags

13. The certification program is now at a stage where licensees have certified material ready to sell, and the aim was to have each tree tagged with the certification details. All nurseries consulted indicated the work involved in tagging every tree was quite onerous, as hundreds of thousands of trees are involved, and this was a disincentive to adopting the certification scheme.

14. The nurseries were keen to see a more efficient method implemented, and this seems sensible to ensure adoption of the system is not jeopardised due to this constraint. APFIP management has acknowledged this issue, and is investigating alternatives during this winter.

Overall conclusion

15. The implementation of a voluntary certification system to the Australian apple and pear industry is a major achievement, particularly in an environment that has required a complete change of attitudes and culture on standards for propagating material. The APFIP team needs to be complimented on its initiative to make such significant changes in the industry, and for the success it has achieved.

16. Certification is seen by most in the industry as the most important part of APFIP, and it should be treated as the highest priority in the immediate future. Changing the attitudes of some critical components of the industry will remain the greatest challenge to achieving the goal of having certified, virus free material throughout the industry.

11. Support for new varieties and breeding programs

The Implementation Plan for the Apple and Pear R&D Investment Plan required that APFIP also take on additional duties related to the supply of internationally-competitive genetic material for the Australian apple and pear industries. These include:

1. Coordinating and driving the supply of new certified varieties, both scions and rootstocks, for Australia.
2. Guiding the breeding of new varieties through the Prevar and DAFWA programs, in particular co-ordination of the science inputs into these programs so that they are as productive as they possibly can be.

11.1 Objectives of current project

Facilitate the stream of scion and rootstock varieties available to the Australian industry.

- A stream of varieties bred overseas being evaluated in Australia.
- The breeding programs serving Australia are underpinned by appropriate science to make them as effective and efficient as possible.

11.2 Target outputs and milestones

Target outputs – current project proposal

1. Supply of varieties from overseas and via Australasian breeding programs
   - Liaise with breeders in Australasia and overseas to access new apple and pear varieties for APFIP evaluation program
   - Aim for about 35 new apple and 25 new pear varieties in the project period 2011-16.
2. Facilitate the stream of scion and rootstock varieties available to the Australian industry.
3. A stream of varieties bred overseas being evaluated in Australia.
4. The breeding programs serving Australia are underpinned by appropriate science to make them as effective and efficient as possible.

Milestones – current project proposal

Supply of new varieties

- New varieties are identified for testing in Australia through the APFIP evaluation program.
- Contacts made with DAFWA apple breeding program, PreVar apple and pear program, other programs in which APAL invests, and other overseas breeding programs, each year.
- Relationships have been built with the main international breeding programs through regular visits to ensure they consider Australia as a commercialisation opportunity.

Guiding the breeding of new varieties through the PreVar and DAFWA programs

- Coordinating the science inputs into these programs
- Encourage collaboration between the PreVar and DAFWA programs in the use of molecular markers, and other pre-commercial technologies.

11.3 Progress

Garry Langford, the APFIP General Manager, has arranged access to new varieties from international breeding programs through international visits organised as part of his other international travel requirements.

The PreVar program has access to advanced technologies such as genomics and molecular markers, but the DAFWA program has not embraced these new technologies and does not have the capability to do so. The ideal goal would be for the PreVar and DAFWA breeding programs to collaborate fully, but this is almost impossible to achieve due to the requirements and constraints on IP ownership and commercialisation partnerships. APFIP's role is therefore restricted to providing leadership and encouragement in the uptake of new technologies by the DAFWA program.

11.4 Benefits to industry

Introducing new varieties from overseas will benefit the Australian industry if the Australian breeding and commercialisation companies do not make an effort to access this material.

11.5 Conclusions

1. The need for APFIP to introduce overseas breeding material depends on the extent this is undertaken by the Australian breeding and commercialisation companies.

2. APFIP does not have a formal role of generating collaborations between breeding organisations in the future environment where all breeding will be undertaken by commercial companies.

3. One evaluation site in the most important apple and pear growing region, the Goulbourn Valley in Victoria, should be maintained to evaluate promising material imported from overseas. This site, funded by grower levies, should be continued until there is confidence in the industry that the Australian breeding and commercialisation companies are accessing all the relevant material from overseas, and making it available to Australian growers. Once the breeding and commercialisation companies are undertaking this role satisfactorily, this site could also be phased out.

12. Pears

The need for evaluating new pear varieties and having certified rootstock and trees applies equally to pears as apples, but progress in pears is well behind the situation with apples. There are no certified rootstocks for pears, and nurseries are not in a position to provide certified or virus clean pear trees. It may be 3 years before this is possible.

Growers conveyed the view that there was a significant opportunity for improvement in pears and developing new varieties that targeted the Asian market. There was support in fostering this part of the industry.

The levy collected for APFIP is based on apple production, not pears. HAL supports a separate project (AP10016) conducted by APFIP that evaluates new pear varieties and rootstocks. The results of this work are published in APFIP's annual Variety Evaluation Report.

12.1 Conclusion

There is little justification in operating a pear evaluation and certification program separately to apples, and a separate HAL project is not required.

13. Commercialisation

13.1 Objective of current project

- The APFIP business will continue to attract grower levies and matched HAL funding.
- By June 2015, certification fees will account for 50% of APFIP income

To achieve this APFIP will need to:

- Continue to grow the certification business, and establish supplies of certified rootstocks and varieties for APFIP certification trademark approved users.
- Continue to expand the evaluation customer base through promoting the value of independent variety information to growers.

13.2 Target outputs and milestones

Target milestones - current project proposal

- Identify and quantify APFIP income sources, particularly from certification.
- Include new income streams in annual budget development

13.3 Commercialisation activities

Certification

Implementing the certification scheme on a commercial basis is a key objective of the APFIP program. Certified rootstocks and nursery trees are being produced by licensed users, under the rules of the APFIP certification trade mark. The trade mark symbol is displayed on the nursery tree tags.

The APFIP certification trademark was granted in November 2004, and signifies that the deciduous fruit trees are free of specified viruses.

Micro propagation

The company in conjunction with 'Yates Botanicals' has developed a micro propagation technique for M9 rootstocks. The agreement provides for all future income from the use of the protocols to be shared equally between APFIP and Yates. The information being used to develop the protocol is freely available.

Consulting services

APFIP offers consulting services in varieties, plant protection including Plant Breeders Rights (PBR) and Trade Marks in Australia. It can also arrange for variety protection for Australian plant material in the USA and European Union. The General Manager is a Qualified Person for Plant Breeders Rights in Australia.

Large scale evaluation services

Separate to this project, and on a commercial fee for service basis, APFIP provides evaluation services for large scale, semi-commercial evaluation plots. Examples are the services provided for the pear varieties arising from the DEPI Vic Breeding program (ANP 0118 and ANP 0131), and advanced selections from Prevar.

13.4 Financial objectives

The APFIP company has five main sources of income.

1. The APFIP levy which is matched by HAL.
2. Fees associated with use of the Certification Trademark.
3. Fees collected for evaluation.
4. Income from non-levy HAL projects.
5. Other commercial income including variety/rootstock licensing, consulting, quarantine-related services, interest, etc.

The aim is to increase income from the royalty associated with use of the certification mark to allow reduction in the amount of money needed from the APFIP levy. With this plan in mind it is anticipated that in 2011/12 (from 1 January 2012) the levy will be reduced from 0.055cents/kg to 0.037 cents/kg.

Comment [GL1]: [illegible]

13.5 Progress

- Identifying and quantifying APFIP income streams has been successfully completed each year as part of the annual budget process.
- The Tree Procurement Service has been developed, as a free or low cost service to growers.
- No other income streams have been developed up to 2013.
- APFIP is on budget with adequate cash reserves.

13.6 Conclusions

1. The APFIP company has established a number of activities that can be operated on a commercial basis and provide commercial returns. The most significant are activities from certification and the use of the APFIP Trade Mark. The 2013-14 budget predicts these two activities will provide an income of $114,500. Other activities such as evaluation, quarantine, other royalties and interest account for about another $34,000. In 2013-14 the anticipated commercial income is $148,000 out of a total company income of $460,000. See table 1 for full budget details.

2. The drive to generate commercial income, in addition to HAL funds, is admirable and has enabled APFIP to undertake additional work that would not have been possible otherwise.

3. The most important issue governing the future of APFIP should be what is required by the industry and how this should be achieved, rather than being driven into activities that will enable the APFIP company to be self-funding.

4. The APFIP Board needs to be clear about its vision for APFIP in the future:
   - Has it done its job?
   - Does it need to continue in a monitoring and policing role?
   - Are there new challenges that need to be addressed?
   - Should the activities of APFIP continue as a self-funded company?
   - Should it continue with support from the special grower levy and HAL matching funds?

5. The reliance on HAL funds through the special levy and matching funds should reduce considerably and more activities should be funded through user pays.
   Quarantine
   - Should not require continuing HAL funds, and there is no opportunity for commercial income.

   Evaluation
   - HAL funding should be transferred from the current evaluation system which benefits variety owners to demonstration blocks that will target growers.
   - APFIP could consider offering an evaluation service for breeding companies on a profit basis.

   Certification
   - HAL funding should continue to support the management and policing of the certification scheme.
   - Commercial funds can be generated from the supply of certified propagating material.

   Other commercial activities that could generate income
   - Micro-propagation.
   - Consulting.
   - Large scale evaluations.

14. Management

The HAL project AF11002 is managed by the company APFIP, which is responsible to a Board. The company operates under a five year business plan and the HAL project is the major component of that business plan. However, there are other minor activities that are conducted by the company that do not fall within the HAL project.

APAL appoints the APFIP Directors, and the Board appoints the chair. The membership of the APFIP Board is identical to the APAL Board, except the chairman of the APAL Board is not a member of the APFIP Board. Scott Price chairs the APFIP Board. Using the same directors on the APAL and APFIP Boards was introduced in 2012 to provide continuity and efficiency. Directors are appointed for a three year term, and are able to serve two terms before retiring.

A Technical Committee exists, but no longer has an effective role.

APFIP operates under an Agency Agreement with Apple and Pear Australia Limited (APAL) as part of APAL's Coregeo Division. The General Manager of APFIP reports to the General Manager of Coregeo. The Agency Agreement sets up a series of principles for the operations of APFIP, including;
- APAL is able to enter into agreements on behalf of APFIP.

- APFIP intellectual property is retained by APFIP.
- APAL provides direction to APFIP and helps define the role of APFIP.
- The cost of APAL's services to APFIP are repaid over time.

APAL charges APFIP a management fee of about $30,000 pa.

The project supervisor is the General Manager, Garry Langford. Garry has been involved in APFIP since its inception in mid 1996, and was appointed National Coordinator in 1997. Garry's time in the project was reduced to 85 per cent in 2009, and to 15 per cent in 2011. The day to day operations are now conducted by the Evaluation coordinator, Mark Hankin, who was appointed in 2009.

APAL assists with communication activities such as drafting articles and reports, including preparing the milestone reports. The back page of the Australian FruitGrower magazine is available for APFIP news.

14.1 Benefits to industry

The industry has benefited considerably through the general expertise and support provided by APFIP. Many growers commented on the value they had received from APFIP staff through advice and support in arranging access to quality tree material. A specific example quoted was the overall benefit to the Western Australian industry by providing growers quick access to the M26 rootstock using 6,000 in vitro seedlings.

The knowledge and experience of the key APFIP staff in the pome fruit and nursery industries, both in Australia and overseas, is invaluable to the Australian industry. This knowledge and experience has been utilised commercially for new APFIP services such as a tree procurement service. They have also played a significant role in educating growers in implementing new management systems.

14.2 Conclusions

1. The APFIP services are regarded by APAL and the industry as essential infrastructure. Much has been invested in their establishment, they provide competitive advantage to industry, and the greatest benefits from the resources invested to date, are yet to come.

2. Establishing the APFIP program as a company under a Board was astute as it generated ownership by the industry. It was seen to be funded by growers and the decisions were made by a grower base. This was particularly important in the early days as there was some feeling against the initiative. This ill-feeling appears to have disappeared and there is now broad support for the APFIP program.

3. There is some criticism of the APFIP Board now being in common with the APAL~~APFIP~~ Board, and some growers felt APFIP may have lost some focus because of this decision. There was also a feeling the APFIP Board may be too operational, and did not give enough thought about major issues confronting APFIP and its future. While it may be more desirable to have different directors on the APFIP and APAL Boards, there is always a challenge of attracting enough directors with the required skills to service two Boards.

4. The staff members of APFIP are very highly respected, and all co-operators spoke highly of their commitment, passion and support. Staff keep in regular contact with co-operators. Garry Langford has led the program from its inception, and its success has been largely due his efforts and his high profile. He was a champion for the program, and many initiatives were achieved only through his persistence. Many involved in the program wonder about the implications of Garry moving onto other activities and having a relatively minor role in APFIP in the future. Mark Hankin has been appointed to take on the full time operational role, but while he is very competent and highly regarded, and co-operators say he does an excellent job, it will be difficult for him to fill the shoes left by Garry.

5. Most growers consulted considered APFIP is a good use of their levies. It is also strongly advocated that, if there is no longer a need for the levy in the future, it should not be removed, as it will be hard to re-introduce later. It was proposed that the levy should either be re-directed to other work, or simply set to zero.

Areas requiring improvement

6. Reporting
   The reporting process could be improved considerably. I found it very difficult in reviewing this project to gain a true understanding of the overall objectives, the specific targets for each reporting period, and the progress against the overall objectives. This report has virtually re-created a structure that enabled an assessment to be made. Problems occurred due to:
   - Reports are disjointed, partly due to separate reporting to HAL and the APFIP company. In some cases the report for the company business plan gave a reasonably clear indication of good progress, but this was not apparent in the HAL report.
   - Some reports documented progress at quite a specific operational level, but did not put this into context on how progress of the overall objectives was being achieved.
   - Some progress report were not substantial enough to enable an accurate assessment to be made of progress.
   - Reports on progress against some milestones and objectives were sometimes not consistent or clear e.g. it was difficult to reconcile the progress in certification that is claimed.

7. Communications
   It is evident that while the co-operators and licensees are aware of the APFIP program and its achievements, many general growers are not aware of its existence and do not use the evaluation information. APFIP has achieved some remarkable results, but this is not communicated effectively enough to the broader industry. The web site needs updating.

Future

8. The quarantine initiatives are largely completed, and future activities need only involve monitoring and implementation of new technologies as they arise. This can largely be achieved by liaison with AQIS.

9. The evaluation trials are largely for the benefit of breeders and variety owners, but this role should become the responsibility of these organisations in the future as breeding and commercialisation is undertaken by commercial operators rather than through public organisations.

10. Certification processes are now in place and the major task remaining is to get broader acceptance of the use of certified propagating material. This will require ensuring that adequate material is available, demonstrating the benefits of certified material, promoting the concepts to growers, and creating the situation where nurseries not currently participating are forced into the scheme through grower pressure.

11. There will need to be some on-going role of APFIP in the future, to protect the previous investment, and ensure the initiatives continue to be implemented.
    - On-going management and control of the certification process.
    - Education on the benefits of using certified propagating material, through demonstration trials.
    - Evaluation of new apples imported from overseas.
    - Evaluation of new apple varieties in large demonstration blocks for access by farmers.

    These issues can be regarded as market failure, so it is in the interests of the industry to ensure they are addressed and funded. If these tasks are not supported, the efforts to date will be lost. The program will still need some oversight.

    New initiatives or industry challenges that arise in the future should be considered, but should be the subject of new specific project proposals.

15. Analysis of investments

The investments in APFIP from HAL since its inception in 1997 to the end of the current project in 2016 are mapped out in table 1. HAL has regularly contributed around $220,000 per year to the APFIP project, with a maximum of $347,000 in 2000-01. By the end of the current HAL project in 2016, the total investment for the 20 years will have been just over $4.7m. This should be considered a good

investment, given the outcomes that have been achieved and the impact the project has had on the overall industry attitudes.

The HAL project and funding is a major component of the operations of the overall APFIP program run by the APFIP company, as outlined in the APFIP company budget for 2011-2016 in table 2. The APFIP company attracts additional funding:

- HAL funding of between $42,000 to $72,000 per annum.
- Income from commercial activities which is predicted to reach $181,000 by 2016.

Expenditure is allocated between R&D and commercial activities proportionally where appropriate.

Table 1: Summary of income and expenditure for the life of the APFIP projects from 1997 to 2016

Year	Apple and pear levies	HAL matched grants	Total HAL contributions	Salaries	Travel	Operating	Capital	Total expenditure	Surplus/ Deficit
AP96035									
1997-98	148,939	148,939	297,878	58,520					
1998-99	87,361	87,361	174,721	88,392					
1999-00	21,289	21,289	42,578	37,840					
Project total 1997-00	257,589	257,589	515,177	184,753	0	27,000	220,425	33,000	515,177	0
AP00026									
2000-01	173,305	173,305	346,610						
2001-02	138,346	138,346	276,692						
2002-03	146,971	146,971	293,942						
2003-04	154,513	154,513	309,026						
2004-05	156,535	156,535	313,070						
2005-06	45,000	45,000	90,000						
Project total 2000-05	814,670	814,670	1,629,340	173,910	142,666	275,010	574,518	160,000	1,629,340	0
AP05017									
2005-06	138,875	138,875	277,750			12,500	227,500		240,000	
2006-07	65,125	65,125	130,250			12,500	215,500		228,000	
2007-08	110,000	110,000	220,000			12,500	205,000		217,500	
2008-09	110,000	110,000	220,000			12,500	205,000		217,500	
2009-10	110,000	110,000	220,000			12,500	205,000		217,500	
Project total 2005-10	534,000	534,000	1,068,000			62,500	1,058,000		1,120,500	-52,500
AP1000									
2010-11	110,000	110,000	220,000	85,000	38,000	0	97,000	0	220,000	
Project total 2010-11	110,000	110,000	220,000	85,000	38,000	0	97,000	0	220,000	0
AF11002									
2011-12	155,317	155,317	310,635						
2012-13	104,857	104,857	209,713						
2013-14	114,857	114,857	229,713						
2014-15	104,857	104,857	209,713						
2015-16	154,857	154,857	309,713						
Project total 2011-16	634,744	634,744	1,269,488	414,593	147,136	68,113	593,444	86,200	1,269,488	0
Overall total	2,351,003	2,351,003	4,702,005	1,160,257	328,102	433,531	2,593,385	339,200	4,754,505	52,500

Note: The income and expenditure in the 1997-00 project cannot be reconciled from the project proposal provided. An amount of $270,425 is not allocated in the proposal. This has been included in operating in this budget summary to balance the totals.

Table 2: APFIP company budget 2011-2016

Item	2011-12			2012-13			2013-14			2014-15			2015-16		
	HAL R&D	Commercial	Total	HAL R&D	Commercial	Total	HAL R&D	Commercial	Total	HAL R&D	Commercial	Total	HAL R&D	Commercial	Total
INCOME															
Apple and pear levy	120,000			120,000			120,000		120,000	120,000		120,000	120,000		120,000
HAL matched grants	120,000			120,000			120,000		120,000	120,000		120,000	120,000		120,000
Total HAL contributions for APFIP	240,000		240,000	240,000		240,000	240,000		240,000	240,000		240,000	240,000		240,000
Other HAL projects	62,000			42,000		42,000	72,000		72,000	62,000		62,000	62,000		62,000
Total HAL	302,000		302,000	282,000		282,000	312,000		312,000	302,000		302,000	302,000		302,000
Quarantine		11,000			11,200			11,000	11,000		11,000	11,000		11,000	11,000
Evaluation		8,000			9,200			10,000	10,000		10,000	10,000		10,000	10,000
Certification		23,000			27,000			32,000	32,000		37,000	37,000		37,000	37,000
Royalties (APFIP Trade Mark)		2,000			55,000			82,500	82,500		110,000	110,000		110,000	110,000
Other		5,107			12,607			12,607	12,607		12,607	12,607		12,607	12,607
Total commercial income		49,107	49,107		114,607	114,607		148,107	148,107		180,607	180,607		180,607	180,607
Total income	302,000	49,107	351,107	282,000	114,607	396,607	312,000	148,107	460,107	302,000	180,607	482,607	302,000	180,607	482,607
EXPENDITURE															
Board operations	4,000	1,000	5,000	4,140	1,035	5,175	4,285	1,071	5,356	4,435	1,109	5,544	4,590	1,148	5,738
Technical Advisory Committee	7,920	1,980	9,900	8,197	2,049	10,246	8,484	2,121	10,605	8,781	2,195	10,976	9,088	2,272	11,360
Agency agreement (APAL)	24,000	6,000	30,000	24,000	6,000	30,000	24,000	6,000	30,000	24,000	6,000	30,000	24,000	6,000	30,000
Salaries	69,560	29,811	99,371	76,536	32,793	109,329	84,268	36,072	120,340	92,585	39,679	132,264	92,585	39,679	132,264
Travel	29,672	7,418	37,090	30,711	7,678	38,389	31,785	7,946	39,731	32,898	8,225	41,123	33,524	8,394	41,918
Administration	33,598	5,275	38,873	34,714	5,438	40,152	35,787	5,586	41,373	36,896	5,740	42,636	38,045	5,899	43,944
Acquisition		23,670	23,670		26,319	26,319		29,524	29,524		32,067	32,067		33,208	33,208
Evaluation - apples and pears	85,680		85,680	72,694		72,694	67,238		67,238	64,674		64,674	65,642		65,642
Certification	13,117		13,117	16,766		16,766	14,617		14,617	17,028		17,028	17,240		17,240
Quarantine	750	10,000	10,750	776	10,000	10,776	803	10,000	10,803	832	10,000	10,832	861	10,000	10,861
Repository	16,745		16,745	16,796		16,796	19,366		19,366	20,457		20,457	21,560		21,560
Communications	7,755		7,755	5,128		5,128	5,308		5,308	5,494		5,494	5,686		5,686
Other		2,000	2,000		2,000	2,000	0	2,000	2,000		2,000	2,000		2,000	2,000
Total expenditure	294,797	87,154	381,951	292,578	93,311	385,889	295,841	100,320	396,161	308,080	107,615	415,695	312,845	108,590	421,435
Surplus/deficit	7,203	-38,047	-30,844	-10,578	21,296	10,718	16,159	47,787	63,946	-6,080	72,992	66,912	-10,845	72,017	61,172

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Appendix 1: Stakeholders visited

Group	Stakeholder	Position	Date visited
HAL management	Alok Kumar	Breeding and Biotechnology Portfolio Manager	17 Feb 2014
APFIP	Garry Langford	General Manager	18 Feb 2014
	Mark Hankin	Evaluation Coordinator	18 Feb 2014
APAL Board	John Lawrenson	Chairman	31 Jan 2014
	Scott Price	Director, Tas	31 Jan 2014
	Philip Turnbull	Director, Vic (Pear)	31 Jan 2014
	Kevin Sanders	Director, Vic (Apples)	31 Jan 2014
	Jason Jarvid	Director, WA	31 Jan 2014
	Mark Joyce	Director, SA	31 Jan 2014
	Greg Mouat	Director, NSW	31 Jan 2014
	Scott Mantague	Director, Vic	31 Jan 2014
	Rosie Savio	Director, Qld	31 Jan 2014
Evaluation co-operators	Ian Bolitho	Mooroopna North, Vic	30 Jan 2014
	Alex Turnbull	Ardmona, Vic	30 Jan 2014
	Scott Price	Huon Valley, Tasmania	18 Feb 2014
	Michael Stafford	Lenswood, SA	20 Feb 2014
	Mel Ware	Lenswood, SA	20 Feb 2014
	Ben Darbyshire	Donybrook, WA	18 Feb & 6 Mar
	David Stewart	Manjimup, WA	28 Feb 2014
	Ralph Wilson	Batlow, NSW	20 Mar 2014
	Ken Perry	Orange, NSW	
	Dino Rizzato	Stanthorpe, Qld	
Certification nurseries	Brendon Francis	Tahune Fields Nursery, Lucaston, Tasmania	18 Feb 2014
	Brian Page	Tangara Nursery, Grove, Tasmania	18 Feb 2014
	Matthew Lenne	Ardmona, Vic	30 Jan 2014
	Andrew Routley	Little Tree Company, Katunga, Vic	30 Jan 2014
	David Bazzani	Olea Nursery, Manjimup, WA	28 Feb 2014
	Peter Wicks	Balhannah Nurseries, Charleston, SA	20 Feb 2014
Variety owners	Fucheng Shan	Breeder, DAFWA, South Perth	27 Feb 2014
	Steele Jacob	TO, DAFWA, Manjimup	27 Feb 2014
	John Sutton	TO, DAFWA, Manjimup	27 Feb 2014
	Kevin Lacey	TO, DAFWA, South Perth	27 Feb 2014
	David Windsor	Director, Irrigation Agriculture Development	27 Feb 2014
	Susanna Turpin	Pear breeder, DEPI, Tatura, Vic	27 Mar 2014
Quarantine	Mark Whattam	Post Entry Quarantine Mngr, AQIS, Knoxfield, Vic	31 Jan 2014
Virus indexing	Brendon Rodoni	Manager, Crop Hygiene, AgriBio, Bundoora, Vic	31 Jan 2014