June 2018 Final Report and Recommendations

Final report with overview and analysis.
Pink Lady Pollination Project

FINAL REPORT AND RECOMMENDATIONS

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Prepared for Apple and Pear Australia Ltd by Daniel Mackey at Purculote Consulting (daniel@purculate.com)
Purcolate acknowledges the Wadjuk people of the Nyoongar nation as the traditional custodians of the lands where we live and work and pay respect to their elders past and present.
THE PINK LADY® POLLINATION PROJECT: FUTURE PROOFING THE BRAND AND ITS SUPPLY CHAIN

Apple and Pear Australia Ltd (APAL) is pursuing the development and implementation of a standardised approach to ensuring Pink Lady® branded product, and the growing environments involved in its production, are contributing to improvements in bee population sustainability. This is considered an important step in future proofing the Pink Lady® brand on a number of fronts:

- **Productivity**: Wild and managed pollinator health is considered a vital ingredient for ensuring the future productivity and yield requirements to meet global food demand.
- **Protecting against reputational risk**: Bee, and other pollinator, population sustainability is growing traction worldwide as concern for consumers and retailers.
- **Protecting against regulatory risk**: Globally, we are seeing an increasing interest among governments in increasing protections from negative environmental impacts, including impacts on pollinator populations.

By engaging growers and stakeholders on the development and implementation of a bee sustainability program APAL believes it can ensure the future growth and sustainability of the Pink Lady® brand.

The following discussion paper has been developed to seek comment from growers, members, and stakeholders on the content, methodology and implementation of such a program. Stakeholder input and support for any program is important to APAL in its goal to ensure any approach implemented program is credibility, impactful and has longevity.

**Original Project Objectives**

1. Directly contribute, in a measurable way, to reduced attrition of bee populations on farms producing Pink Lady® apples
2. Develop an executable set of Principles and Criteria to achieve the 1st objective.
3. Develop an appropriate communications strategy which builds stronger brand value for consumers

**Background: An economic, social, and environmental imperative.**

More than three quarters of the leading types of global food crops rely to some extent on animal pollination for yield and/or quality. Pollinator-dependent crops contribute to 35 per cent of global crop production volume.

(IPBES 2016, p8)

In 2016, a United Nations (UN) commissioned report, *Assessment Report on Pollinators, Pollination and Food Production* (IPBES 2016), provided an important validation and summation of what many people already knew. That is, in the face of enormous global population growth, increasing biodiversity loss, and the onset of climate change, the importance of pollination to future global food security, agricultural production and the
environment cannot be understated. The report included a number of observations and assessment regarding key drivers and risks to pollinator populations:

The abundance, diversity and health of pollinators and the provision of pollination are threatened by direct drivers that generate risks to societies and ecosystems. Threats include land-use change, intensive agricultural management and pesticide use, environmental pollution, invasive alien species, pathogens and climate change.

(IPBES 2016, p10)

Also in 2016, the UN Food and Agriculture Organisation (FAO) released its Manual on Apple Pollination (FAO 2016), in recognition of the significance of apple production to meeting the future global food needs, and the important role that pollination plays.

Emerging evidence also suggest that the negative of pesticides and chemical use on bee populations go beyond the directly lethal to include sublethal effects. These effects are seen later in those bees that survive direct or indirect exposure:

Pollinators may be exposed to mixtures of pesticides through a number of routes, including collection of nectar and pollen from multiple sources, storage of these in colonies of eusocial bees, tank mixes, and overspray of crops in flower where systemic residues are present in nectar and pollen. (pg 66-67)

Understanding of sublethal effects at this stage is limited and requires further research. Here in Australia, the Australian government has recognised for some time the need to increase awareness, research and partnerships aimed at ensuring that pollination, both natural and managed, is utilised to full effect in support of Australia’s agricultural industry (rirdc.gov.au). In Europe similarly and most recently, in an effort to reduce “high acute risks to bees”, the world’s most widely used insecticides would be banned from all fields under draft regulations from the European commission (The Guardian, 24 March 2017). This follows the 2013 European ban on the use of Neonicotinoids already in place.

In Australia for example, Apples are one of a number of ‘100% pollination responsive’ crops. That is, even though production is possible with zero to little additional pollination, the introduction of ‘insect-mediated pollination’, has a 100% success rate of improved yield. A recent study by the Rural Industries Research and Development Corporation (RIRDC), published in February 2017, sought to quantify the economic costs of the current ‘pollinator deficit’ to Australian horticulture and agriculture (RIRDC 2017). Focusing on the Shepperton region of Victoria, the study calculated the potential benefits of repairing the current ‘less than optimal’ utilisation of pollination in Apple farms. With improvements to quality and yield, a revenue increase of 10% is likely. The calculation showed that this increase in revenue outweighed the associated costs, thus making economic sense (RIRDC 2017, p14-15).

Certainly, the survival of most horticultural industries worldwide is dependent on hundreds of thousands of additional honeybee colonies being made available for commercial pollination. This means that more beekeepers must be encouraged to provide these services, rather than relying solely on honey production. A number of challenges to achieving this exist. One pertinent example is the identified barrier to beekeepers providing commercial pollination services, due to the risk of pesticide poisoning of honeybee colonies (RIRDC 2012, p9).
Recognising these current and future issues, APAL sees an opportunity to provide important leadership through leveraging the volume of the leading branded apple in the world Pink Lady®, to positively impact the long term viability of pollinating bees, and so the global apple industry.

Structure to this report

The remainder of this paper is divided into three sections. These are presented as preliminary drafts, for the purposes of generating discussion and feedback:

1. Draft Grower’s Guidelines
2. Compliance Monitoring
3. Implementation

Part 1: Growers Guidelines

The following draft guidelines have been developed using the following:

- A Manual for Apple Pollination (FAO 2016). Available at: http://www.fao.org/a-i5527e.pdf, and
- Agricultural Policies Exacerbate Honeybee Pollination Service Supply-Demand Mismatches Across Europe (Breeze et al 2014). Available at: https://opus.bibliothek.uni-wuerzburg.de/frontdoor/index/index/docid/11769

Consultation on the Draft sought to understand the following:

- To what extent are some of the guidelines already being applied? If they are currently being applied, is this due to the voluntary actions of the grower, requests from local apiarists or in order to comply with other programs?
- Do the guidelines provide appropriate detail to ensure they are applied consistently?
- Do the guidelines provide enough flexibility to allow growers to adapt the requirements to their own circumstances?
- Are there any unintended consequences that might arise from their application?
- Are they potentially onerous?
The Guidelines are divided into three criteria, each with corresponding performance requirements. They cover the 3 on-ground endeavours considered to be the most effective methods to maximise impact:

- Risk reduction
- Increase favourable habitats on farm, and
- Improve relations between growers and apiarists
Note: terms in italics followed by an asterisk (*) are further explained in the Key Concepts section below the draft guidelines.

**Criteria 1a: Risk Reduction (Local)**

Farmers implement strategies to ensure that application of chemicals reduces risk to bee populations.

**Chemicals:**

1. Farmers reduce the need for chemical use by adopting *Integrated Pest Management (IPM)* principles where appropriate.
2. Use of chemicals shall comply with all relevant requirements as directed by law, codes of practice and manufacturer’s instructions.
3. Prior to spraying farmers shall assess and identify, using *best available information*, and with consideration of the *precautionary principle*:
   3.1. Potential geographical range of impacts.
   3.2. Likelihood of bees foraging in the area of application.
   3.3. Hive managers within, or adjacent to, the range of impact.
   3.4. Weather conditions.
4. Decisions of when to spray should ensure appropriate spraying conditions so as to avoid the chance of spray drift affecting non-target flowering crops, hives, and water sources.
5. Prior to spraying, farmers shall contact the managers of hives to ensure managers have enough time to relocate or protect their hives, and are aware of:
   5.1. What chemicals are being applied (spectrum minimised)
   5.2. How they are being applied (as needed only).
   5.3. When and where they will be applied (as needed only).
6. Any reasonable feedback or requests from hive managers to alter plans, shall be given proper consideration.
7. If using spray contractors, farmers inform them of the location of any hives that may be affected and ensure that they understand the importance of reducing the risk of honeybee poisoning as well as applying the above requirements.
8. Where farmers seek to use managed pollination services they will ensure the service providers have access to the details of any recent applications of fertiliser, pesticides or herbicides.

**Netting:**

9. Where netting has already been applied, growers should seek advice from the hive manager regarding:
   9.1. Ensuring an adequate food and water source under the netting
   9.2. Whether hive and/or pollinator rotation might be necessary.
   9.3. Optimal timing of hive placement, ensuring there is enough percentage of flowering (>5%).
   9.4. Reducing chemical use under nets in the lead up to hive placement (see Criteria 1a).
10. When erecting new nets the following should be considered to create a pollinator friendly environment:
    10.1. Ensure a gap between the top of the crop and netting to allow easier movement of pollinators between rows.
    10.2. Installation allows nets to be lifted at the ends or sides.
10.3. Seek advice on how to ensure adequate ventilation.
10.4. Try to select netting that will allow as much ultraviolet light as possible to penetrate through.

**The Challenge of Netting**

Consultation with apiarists and researchers on the original draft pointed to the use of hail netting as a key issue.

“Not only are the native pollinators and feral honeybees not interested in visiting under the nets, the commercial hives we place also do everything they can to leave. The hive health and strength post pollination when compared to under net and not is vastly different. Hives placed under nets are always weaker and less healthier than open orchards. In addition, the design of the structures significantly vary so that there is no one rule fits all, for example some guys have nets that they can pull back the roof on every second row allowing free movement of the bees and some have a solid roof. Another notable design difference is the height of the structures, more space between the crop canopy and the roof also appears to improve hive health.” (Consultation Feedback)

The impact of netting on pollinators is linked to a number of environmental changes that can occur under enclosures:

“… enclosures, which are an important component of modern agriculture, require special consideration with regard to bee pollination of the crops they enclose. Limiting food sources, covering with UV absorbing materials, creating high humidity and high temperature all place special demands upon, and might adversely affect, crop pollinators within enclosures.” (Arnon 2008, p164)

Based on follow up discussions Criteria 1a was updated to increase the scope beyond risk management related to chemical application to include physical infrastructure, in particular netting. In effect the Criteria has been divided into 2 sections: chemicals and netting. However, research and testing is still underway that will help to determine best practice. For more information see Goodwin. M, 2012, *Pollination of Crops in Australia and New Zealand*, Rural Industries Research and Development Corporation. Available at: [https://agrifutures.infoservices.com.au/items/12-059](https://agrifutures.infoservices.com.au/items/12-059) A good summary of the issues can be found here: [http://beeaware.org.au/archive-news/improving-pollination-outcomes-under-netting/](http://beeaware.org.au/archive-news/improving-pollination-outcomes-under-netting/)

**Criteria 1b: Monitoring and Adaptive Management (Local)**

The outcomes and impacts, both negative and positive, of pesticides applications are used to inform future management strategies.

1. Following application of pesticides farmers shall engage hive managers to assess and record any impacts.
2. Where negative impacts, including any demonstrable sublethal effects, are identified farmers shall implement mitigation strategies to prevent further damage.
3. Future application strategies shall incorporate the results of previous post application assessments.

**Criteria 2: Maintaining & then Enhancing Bee Populations. (Local)**

Through farm design to increase ‘Green Infrastructure’ – for this initiative it is defined as favourable habitats for both commercial and wild pollinators contributing to the future sustainability of bee populations available for pollination.

1. Consistent with relevant Best Available Information*, farmers should maintain or restore semi-natural habitats known to provide nesting and floral resources for bees and other known pollinators.
2. Demonstrate investment in, or commitment to, farm design and farm management which balances production with bee conservation goals.
3. Farms work with local apiarists and other interested stakeholders to develop and work towards an appropriate minimum area of habitat per hectare.

**Considerations under Criteria 2**

A question that came up in discussions with experts and a review of the literature dealt with issue of suitable habitat for attracting native/wild pollinators. Should a minimum percentage be set for all growers at the farm or landscape level, or alternatively should parameters be developed for determining regionally specific metrics?

It is recommended that the approach be based on encouraging stakeholder engagement between growers and local groups to ensure a strategy that is appropriate to what is possible and will have an impact in the surrounding landscape.

4. Where appropriate, weed management strategies, such as herbicide application, should allow for some weedy species to exist, where they are known to support the intensity and diversity of bee populations.
5. Where appropriate, farmers should support* broader landscape initiatives aimed at maintaining or enhancing landscape biodiversity.
6. Use of nets shall be consistent with best available information*.

**Criteria 3: Create a Culture which supports Continuous Improvement. (Industry wide)**

Through improved local relationships between growers and apiarists, the incorporation of ecologically sustainable practices is prioritised.

1. Economic modelling co-developed to pinpoint an accurate number of commercial bees required to pollinate (reduce wastage, reduce cost)
2. Opportunities to support and allow beehives to be placed on farms are explored.
3. Partnerships with beehive managers, or utilisation of their services, shall support the long-term economic viability of the local beehive industry.

**Feedback from both growers and apiarists indicated general support across the board for improved relationships at the local, regional and industry wide levels.**

4. Once available, growers incorporate use of online communication tools developed to increase apiarist awareness of spraying times and other unfavourable production practices. In parallel, communication of apiarists activities on farms is maintained.

**Key Concepts**

**Integrated Pest Management (IPM):** A term used to describe a holistic approach to pest management, aimed at reducing unnecessary pesticide application.

**Best Available Information:** can include government, industry or academic produced guidance and best practice, expert opinions or consultations with stakeholders. APAL and other national offices will keep an up to date resource to assist access to best available information.

**Precautionary Principle:** the precautionary principle directs that action be taken to reduce risk from chemicals in the face of uncertain but suggestive evidence of harm. ([http://www.pan-germany.org/download/PAN_Briefing_Precaution_060914.pdf](http://www.pan-germany.org/download/PAN_Briefing_Precaution_060914.pdf)] This mirrors the RIRDC advice that, “In the absence of expert advice, the most responsible approach is for beekeepers and farmers to assume that chemical combinations are toxic, and to avoid this practice in situations where honeybees may be affected.”

**Support:** this can include participation in, or the incorporation of, any land-management practices that align with landscape level biodiversity objectives undertaken by other organisations or initiatives.

**Terminology:** Pay attention to the use of key words such as ‘shall’, ‘should’ and ‘may’ as this determines the level of responsibility:

- Shall – a requirement.
- Should – a recommendation.
- May – allows for.
PART 2: COMPLIANCE MONITORING

At present, the key intervention point for APAL in licensed supply chains is at the pack house, destination cold storage and pre-packing, for the purpose of quality inspections. There is little direct interaction with growers by the Pink Lady® brand for the purposes of managing compliance to the guidelines for Pink Lady® branding. This raises the question of compliance monitoring, and how best to ensure that growers are following the guidelines and apples sold under the Pink Lady® trademark are consistent with any claims made regarding their environmental impact.

It is important that the right balance is struck between ensuring consistent application of the guidelines, not creating unnecessary or arbitrary compliance requirements, and creating a system that allows a risk based approach to any additional interventions or actions related to non-compliance or poor performance.

The following general compliance approach was put forward for the purposes of generating feedback.

1. APAL develops online reporting tools to help growers self-assess their actions and the outcomes of following the guidelines, to a level of detail sufficient for assessing each individual indicator.
2. The online tool is also developed for local apiarists to raise any concerns or impacts in their local area that they believe are the result of apple grower’s actions.
3. Data is accessed by licensees in order to confirm compliance for a designated period prior to receipt of produce.
4. APAL inspectors/quality managers include discussions with growers and apiarists in their routine inspections to ensure the validity of data collected and highlight any areas at risk of non-compliance.

Consultation Focus

1. Do the above measures go far enough to ensure guidelines are consistently applied and followed?
2. Do they go too far, creating an onerous level of additional reporting for growers, packers and inspectors that outweighs any benefits?
3. Are there any alternate approaches that might be considered?

Feedback from growers indicated concern or unease with the potential duplication of requirements with accreditations already being implemented by growers, such as Global GAP and Tesco’s Nature’s Choice.

While there is some overlap with regards to the use of chemicals for example there is still some distinctions. It will be important to keep an eye on the ongoing standard revisions by Global GAP’s technical committees. https://www.globalgap.org/uk_en/who-we-are/governance/technical-committees/
PART 3: IMPLEMENTATION

Implementing the project will require an iterative approach that allows for adaptive management that ensure the implementation is credible while not being too onerous on growers. There will also need to be consideration of other approaches and initiatives overseas.

Global Alignment

Whilst the Pink Lady Pollination Project has been in development over the past 18 months there has been a complimentary program being undertaken in the Northern Hemisphere titled BeePink.

The BeePink Program has been developed by the European marketing arm of Pink Lady. There are a number of overlaps and distinctions, Table 1.

Considerations for aligning the two approaches:

- The Pink Lady Pollination Project isn’t a third-party certification scheme, it’s in-house. That means you have the ability to define where the program’s credibility comes from, including at a global level. The key variable, as you know, is what the claim is and where it’s made. For example, consumers would rightly have different expectations between claims on product versus claims online, etc.
- The challenge is the consistency aspect of credibility. How do you credibly house different approaches under a single global program?
- The easiest way to harmonise and avoid risk is to have a defensible and evidence-based set of ‘guiding principles’ that articulate a logical approach for countries choosing different approaches.

Measure and engage are two consistent activities that should happen everywhere. If you keep those consistent, then the global program could follow the same seasonal loop, at a country or regional level:
1. **Measure:** follow a best practice and risk-based approach to measurement that can be applied relatively consistently across each country. (Randomised hive weighing for example)

2. **Engagement and Prioritise:** work with some key stakeholders to identify the activities that will have the most impact and the most appropriate implementation form. (Accreditation through licensing, Project support, Technical Guidance) Engagement could include an audit of existing accreditations used by farmers in a given area, giving the program opportunities to recognise what they are already doing and perhaps even set up co-communications with other orgs.

3. **Implement:** Spend the season focusing on a few key areas.

4. **Repeat.**

In this scenario, the drafted guidelines can guide the standards and expectations of individual projects. We just need to add netting and other specifics. The guidelines, combined with the suite of BeePink tools could be turned into a toolkit for countries/regions to guide best practice in measurement, engagement, prioritisation and implementation. If measure and engage (at a country level, not a farm level) are done reasonably consistently around the world you will deal with any risks to credibility by countries following different paths. You manage what you measure, as the saying goes.

Table 2 contains potential steps for the implementation and testing of the draft guidelines aligned against the seasons. There will need to be focused effort on overcoming key issues, such as netting.
**Table 1: BeePink and PLP Comparisons**

<table>
<thead>
<tr>
<th></th>
<th>BeePink</th>
<th>Pink Lady Pollination Project (PLPP)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content</strong></td>
<td>Guidance</td>
<td>Performance Criteria:</td>
<td>Performance criteria includes the use of ‘Best Available Information’ (BAI) to inform grower decision making. BeePink guidance would be a key example of BAI.</td>
</tr>
<tr>
<td></td>
<td>• Pollination</td>
<td>• Chemicals (integrated pest management)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hedges</td>
<td>• Stakeholder engagement</td>
<td></td>
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<tr>
<td></td>
<td>• Water management</td>
<td>• Adaptive management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Good phytosanitary practices</td>
<td>• Pollinator habitat</td>
<td></td>
</tr>
<tr>
<td><strong>Approach</strong></td>
<td>Educate and engage</td>
<td>Educate, engage, measure, administer</td>
<td>Whilst additional processes and compliance exist under PLPP, these would hopefully ensure more credibility in communications and stakeholder perceptions.</td>
</tr>
</tbody>
</table>
Table 2: Process for implementation.

<table>
<thead>
<tr>
<th>Stages</th>
<th>Steps</th>
<th>Description</th>
<th>Sequencing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage 1</strong></td>
<td><strong>Consult and design</strong></td>
<td>APAL works with members, stakeholders and experts to the design guidelines' content, associated compliance methodology and establish key partnerships for implementation.</td>
<td>Results from Stage 1 will be used to inform:</td>
</tr>
<tr>
<td>To be completed prior to April Harvest (South)</td>
<td><strong>Measure and test</strong></td>
<td>Working with local growers and stakeholders in targeted areas to establish baseline metrics for progress reporting, and pilot testing guidelines/processes.</td>
<td>• <strong>Guide and support</strong> – content of guidelines and approach to supporting activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• <strong>Integrate</strong> – reasonable reporting KPIs, regions and issues requiring priority support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Key issues for testing and further testing include netting and reporting requirements.</td>
<td>• <strong>Embed</strong> – Benchmarks for individual grower compliance and benchmarks for industry/region compliance</td>
</tr>
<tr>
<td></td>
<td><strong>Integrate</strong></td>
<td>Voluntary reporting commences, giving licensees and growers the opportunity to integrate processes prior to formal implementation.</td>
<td>Successful transition from Stage 2 to Stage 3 critical to level of credibility in Stage 4</td>
</tr>
<tr>
<td><strong>Stage 2</strong></td>
<td><strong>Guide and support</strong></td>
<td>To support the implementation of the guidelines APAL will make available online guidance, best practise examples and other resources.</td>
<td></td>
</tr>
<tr>
<td>To be completed during Aug/Sep Pollination Season (South)</td>
<td><strong>Integrate</strong></td>
<td>Voluntary reporting commences, giving licensees and growers the opportunity to integrate processes prior to formal implementation.</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 3</strong></td>
<td><strong>Embed</strong></td>
<td>Reporting requirements become embedded into APAL's existing quality control procedure.</td>
<td></td>
</tr>
<tr>
<td>To be completed during Pollination and Harvest (South)</td>
<td><strong>Communicate</strong></td>
<td>Incorporate project metrics and messaging into corporate and retail marketing.</td>
<td></td>
</tr>
</tbody>
</table>
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Breeze TD, Vaissière BE, Bommarco R, Petanidou T, Seraphides N, et al. (2014) “Agricultural Policies Exacerbate Honeybee Pollination Service Supply - Demand Mismatches Across Europe”. In PLoS ONE, Volume 9, Issue 1 Available at: https://opus.bibliothek.uni-wuerzburg.de/frontdoor/index/index/docId/11769


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