

**Biosecurity implementation to strengthen
Australia's honey bee and pollination
responsive industries**

Sam Malfroy, Jo Slattery, Rodney Turner and Brad Siebert
Plant Health Australia

Project Number: MT10058

MT10058

This report is published by Horticulture Australia Ltd to pass on information concerning horticultural research and development undertaken for:

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The research contained in this report was funded by Horticulture Australia Ltd with the financial support of:

Australian Melon Association Inc
Canned Fruits Industry Council of Australia
the almond industry
the apple and pear industry
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the cherry industry
the dried prune industry
the summerfruit industry
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ISBN 0 7341 3033 3

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

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Horticulture Australia

Final Report

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Australia's honey bee and pollination responsive
industries**

HAL project number MT10058

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Plant Health Australia

21st December 2012

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Report statement:

This report summarises the outcomes of project MT10058 for the development of an Industry Biosecurity Plan for the Honey Bee Industry, Biosecurity Manual for the Honey Bee Industry, four Contingency Plans and a Biosecurity Online Training Module (BOLT).

Acknowledgement:

PHA would like to recognise all who have contributed financially and in-kind to this project, including

- Horticulture Australia Ltd
- Australian Honey Bee Industry Council
- Rural Industries Research and Development Corporation



21st December 2012

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“Any recommendations contained in this publication do not necessarily represent current HAL policy. No person should act on the basis of the contents of this publication, without first obtaining specific, independent professional advice in respect of the matters set out in this publication”.

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1. Media summary

Australia's geographic isolation and lack of shared land borders has offered some protection from the arrival of exotic pests and diseases. Like many of Australia's plant industries, the honey bee industry recognises that their health status can be protected and improved through the implementation of biosecurity measures that maintain and retain freedom from exotic pests. Minimising the risks posed by exotic pests, and responding effectively to pest threats ensures the future viability and sustainability of the honey bee industry. Maintenance of our plant health status is also vital for retaining existing trade opportunities, negotiating access to new overseas markets and ensuring the future profitability and sustainability of the honey bee industry.

The objective of this project (MT10058) was the development of a Honey Bee Industry Biosecurity Plan (IBP), a Biosecurity Manual for the Honey Bee Industry, four pest specific Contingency Plans and a Biosecurity Online Training (BOLT) module.

The Honey bee IBP provides the honey bee industry with the framework for risk mitigation and to manage the impact of potential pest incursions. Specifically the IBP identifies the highest risk exotic pests to the industry, determines risk mitigation activities that can reduce the biosecurity threat including apiary level activities, assesses surveillance and diagnostic activities and capabilities available, and investigates how the industry would deal with any exotic pest following detection.

The Biosecurity Manual for the Honey bee Industry provides plain and practical advice for both commercial and hobby beekeepers on how to protect their honey bees from key established and exotic pests and diseases, as well as how to prepare for incursions and minimise the potential impact of any such incursions.

The Biosecurity Online Training (BOLT) module is based on sections from the Biosecurity Manual and is mainly targeted at hobby/amateur beekeepers. The BOLT module is present in an online format so that links can be provided for pest specific fact sheets, production records, biosecurity best practice checklists, biosecurity signs, as well as the Biosecurity Manual. At the end of the BOLT module a quiz containing 15 multiple choice questions is included so that beekeepers, or anyone interested in keeping honey bees, could test their knowledge on honey bee biosecurity.

Four Contingency Plans were developed for Varroa mites (*Varroa destructor* and *V. jacobsoni*), Tropilaelaps mites (*Tropilaelaps clareae* and *T. mercedesae*), Tracheal mite (*Acarapis woodi*) and Braula fly (*Braula coeca*). These Contingency Plans provide background information on the pest biology and available control measures to assist with preparedness for a honey bee Emergency Plant Pest (EPP) incursion into Australia. It provides guidelines and options for steps to be undertaken and considered when developing a Response Plan to these specific honey bee EPPs.

The development and completion of the Honey Bee IBP, Biosecurity Manual for the Honey Bee Industry, four Contingency Plans and the BOLT module was a collaborative effort

between the Australian Honey Bee Industry Council (AHBIC) and Plant Health Australia (PHA). The cooperation and input of a committed group of experts from government agencies and industry in review of the IBP was also appreciated.

AHBIC has undertaken this biosecurity planning and implementation in the form of the Biosecurity Manual for the Honey Bee Industry and BOLT module on behalf of its member states and beekeepers from around Australia to protect and maintain a viable and high value honey bee industry. This pre-emptive planning process has boosted the industry's capacity to deal with the threat of new pests.

Biosecurity threats, their priority and Australia's preparedness and capacity to respond to these threats (including surveillance programs, technical expertise etc.) change over time. PHA will therefore assist the honey bee industry and government stakeholders to regularly review and update the plan, ensuring it contains the latest possible information on pest risks and the most up-to-date strategies for industry protection.

2. Technical summary

Industry biosecurity is the protection from risks posed by organisms to each PHA industry through actions such as exclusion, eradication, and control. Industry biosecurity is a shared responsibility involving governments, industry and the general community.

The objective of this project was the development of:

- An Industry Biosecurity Plan for the Honey Bee Industry
- A Biosecurity Manual for the Honey Bee Industry
- Four pest specific Contingency Plans for the Honey Bee Industry
- A Biosecurity Online Training (BOLT) Module
- Commence implementation of several Actions identified within the *'Honey Bee Industry and Pollination Continuity Strategy for Australia'*

Industry Biosecurity Plan

Development of an Industry Biosecurity Plan (IBP) provides a framework for biosecurity preparedness and allows all stakeholders to participate in, and take ownership of, biosecurity preparedness for their industry

In developing the IBP the following steps were taken:

1. An Industry Biosecurity Group (IBG) was established to oversee the development of the plan.
2. Key threats to the industry were identified and documented.
3. Threat summary tables (TSTs) were developed to identify all pests that may pose a concern to the honey bee industry. From the TSTs, pests of the highest overall risk were identified as the high priority pest list (Threat Identification section).
4. Existing and required risk mitigation activities for the industry were identified (Risk Mitigation section).
5. Gaps in contingency planning were identified (Contingency Planning section).
6. The roles and responsibilities of stakeholder groups were documented.
7. Draft of the IBP was sent to IBG members for review.
8. Endorsement by the Australian Honey Bee Industry Council (AHBIC) (the peak body representing the honey bee industry).
9. Government endorsement of the IBP through Plant Health Committee.
10. The IBP was finalised in December 2012 and is intending to be launched at the 100th Conference of the New South Wales Apiarists Association in May 2013, pending final endorsement.

The benefit of an industry biosecurity plan includes:

- Development of a priority pest list for risk based investment in biosecurity.
- Development of comprehensive knowledge on the current state of biosecurity for that industry, and gaps identified.
- Preparation of an Action list for future biosecurity needs for the industry.
- The identification and documentation of industry threats.
- The identification of industry risk mitigation activities, Contingency Plans and awareness material.
- Identification of the need for appropriate communication and consultation strategies.

Biosecurity Manual

The Biosecurity Manual for the Honey Bee Industry is one of the first steps in implementing the IBP and has been designed to assist the industry in its biosecurity preparedness from new and invasive pests, as well as priority established pests already present in Australia.

The Biosecurity Manual was prepared for both commercial and hobby beekeepers. The manual includes fact sheets on 13 exotic and established pest threats (including images), along with simple and effective practices to identify and mitigate biosecurity risks for people, products, vehicles and equipment. Other sections in the manual include guidelines on product management, how to keep honey bees healthy, how to inspect hives and how to report suspect emergency pests. The manual also links to documents that are now available on the PHA website, such as biosecurity best practice checklist, biosecurity signs and production records. Overall, the manual promotes best management practices and best biosecurity practices to be implemented in any apiary.

Biosecurity Online Training

The Biosecurity Online Training (BOLT) module contains sections from the Biosecurity Manual and is mainly targeted at hobby/amateur beekeepers. The module provides information on how to keep honey bees healthy, how to inspect hives, incorporating surveillance methods into apiary health surveillance programs as well as, guidelines on product management, regional hive movements, and reporting suspect pests or symptoms. The BOLT module also includes links to pest specific fact sheets, production records, biosecurity best practice checklists, biosecurity signs, as well as the Biosecurity Manual. At the end of the BOLT module, a quiz containing 15 multiple choice questions is included so that beekeepers, or anyone interested in keeping honey bees, could assess their understanding of honey bee biosecurity.

Contingency Plans

Four Contingency Plans were developed for Varroa mites (*Varroa destructor* and *V. jacobsoni*), Tropilaelaps mites (*Tropilaelaps clareae* and *T. mercedesae*), Tracheal mite (*Acarapis woodi*) and Braula fly (*Braula coeca*). These Contingency Plans provide background information on the pest biology and available control measures to assist with preparedness for a honey bee Emergency Plant Pest (EPP) incursion into Australia (or in the case of Braula fly entry of the pest into mainland Australia). It provides guidelines and options for steps to be undertaken and considered when developing a Response Plan to these specific honey bee EPPs.

Implementation of several Actions identified within the ‘Honey Bee Industry and Pollination Continuity Strategy for Australia’

A summary of progress against implementation of Actions from this strategy have been summarised in the Result section.

Recommendations from this project include:

- The honey bee industry address the actions identified in the Biosecurity Actions list within the IBP, covering gaps and critical biosecurity areas that are appropriate to the industry. Some of the items in the Action list are
 - Improve legislation between states and territories relating to the control and management of American Foulbrood (AFB), and investigate the possibility of an AFB National Management Strategy.
 - Develop molecular tests for pest bees and bee pests e.g. Africanized honey bees (*Apis mellifera scutellata*) and Tracheal mite (*Acarapis woodi*).
 - Identify chemical control requirements for high priority pest threats and their availability in Australia. Where required, advanced applications for emergency chemical permits / registrations or shelf registrations prepared and submitted to the APVMA.
 - Undertake a national survey to determine the presence or absence of honey bee viruses in European honey bee (*A. mellifera*) in Australia.
 - At an industry level, create a checklist of roles for individual industry members in the event of an incursion. At a regional level, identify the possibility of training Industry Liaison Officers (ILOs) in emergency response responsibilities should an incursion occur.
- The honey bee industry implements its Industry Biosecurity Plan ensuring that its investments are considered through the HAL R&D funding processes.

3. Introduction

Background

In global terms, the Australian honey bee industry is fortunate to experience relative freedom from many pests and diseases that can adversely affect honey production and the provision of pollination services. Maintenance of this high plant health status is vital for retaining existing trade opportunities, negotiating access to new overseas and domestic markets and ensuring the profitability and viability of our honey bee industry.

Industry biosecurity is the protection from risks posed by pests through actions such as preparedness, risk mitigation, exclusion, eradication and control. No quarantine system, no matter how efficient, can ensure Australia's plant industries are totally protected from exotic pests and diseases. Biosecurity is therefore a shared responsibility involving governments, industry and the general community.

Working together with Plant Health Australia (PHA), the honey bee industry through AHBIC has commenced its biosecurity preparedness by developing an Industry Biosecurity Plan (IBP). This document provides a framework for biosecurity activities within the industry and identifies the highest risk pest threats to production and trade.

Development of an IBP is seen as the first step in identifying potential pest threats for the honey bee industry and the requirement for industry biosecurity preparedness. The Honey bee IBP is a review of biosecurity threats, current practices and future biosecurity needs for the honey bee industry. The Honey bee IBP was developed following an extensive review by industry, government and other relevant stakeholders of the pests and diseases overseas that are likely to survive, spread and establish should they be introduced into Australia.

This pre-emptive planning process has boosted the honey bee industry's capacity to deal with the threat of new pests. It puts the industry on the front foot in identifying and minimising risks, and heightens its capacity to respond quickly and effectively to emergency plant pest incursions.

Within this project, a Biosecurity Manual for the Honey Bee Industry was also produced, along with a Biosecurity Online Training (BOLT) module and four pest specific Contingency Plans. These documents will assist the honey bee industry with its biosecurity preparedness and responsibilities.

Aims and objectives

The aim of this project was the development of:

- An Industry Biosecurity Plan for the Honey Bee Industry
- A Biosecurity Manual for the Honey Bee Industry
- A Biosecurity Online Training (BOLT) Module
- Four pest specific Contingency Plans for the Honey Bee Industry
- Implementation of some actions identified within the 'Honey Bee Industry and Pollination Continuity Strategy for Australia'

4. Method and activities

PHA developed the Honey bee IBP based on a generic template used for all its industry members. The process for development of the IBP included establishment of the Industry Biosecurity Group (IBG), preparation of the Threat Summary Tables (TSTs) and consultation with industry experts and researchers on drafts. Endorsement of the IBP was provided by the Australian Honey Bee Industry Council (AHBIC), the peak body representing the honey bee industry and from the Australian Government and state and territory governments through Plant Health Committee. The output from this process is the Industry Biosecurity Plan which contains the following sections:

Introduction:

- Introduction and overview of the IBP and industry specific introductory information.
- A list of potential activities/projects that the industry views as critical for future biosecurity.

Threat identification, Pest Risk Assessments and Categorisation:

- Identification and analysis of pest threats for the industry, compiled into a TST.
- High priority pests identified which pose the greatest risk to the industry.
- Pests whose threat is not fully understood and hence require more research.

Risk Mitigation Plan:

- Pre-emptive strategies that can be adopted at the national, state/territory, regional and individual producer levels to reduce the risks posed by emergency plant pests (EPP).
- Fact sheets or other materials (or reference to other information) that increase industry awareness of key emergency pests and improve biosecurity within the industry.

Contingency Planning and Response Management:

- Reference to the overarching framework, PLANTPLAN (the National Emergency Preparedness and Response Plan).
- The general procedures, organisations and contacts responsible for handling an emergency plant pest incident within the industry.
- A communication chain/strategy for communication in an incursion.

PHA, in cooperation with AHBIC, organised an IBG to provide advice on the coordination and management of the individual biosecurity plans. The Honey Bee IBG consisted of over 25 representatives from various organisations including AHBIC, Department of Agriculture, Fisheries and Forestry (DAFF), Rural Industries Research and Development Corporation (RIRDC), Horticulture Australia (HAL), PHA, state and territory department of primary industries, honey bee scientists as well as beekeepers and pollinators.

A meeting was held with the IBG in March 2012 where important issues relevant to the industry were raised and flagged for inclusion in the plan. Initial work on the TSTs was provided to the IBG based on literature reviews, the old AUSVETPLAN and import risk analyses completed previously by Biosecurity Australia. This draft list was reviewed by members of the IBG.

Through this consultation process, the list was finalised and each pest, where information was available, was given a threat ranking based on four criteria; entry, establishment, and spread potential, and overall economic impact. From this ranking process and further consultation the high priority pest list was compiled. Once identified these pests provide a focus for further biosecurity activity within the industry such as surveillance, contingency planning, diagnostic and pest control research, on-farm biosecurity training and awareness activities.

Specific activities identified by the IBG were combined with the template to develop the Risk Mitigation Plan section. Current response management procedures were identified and included in the Contingency Plan and Response Management section.

Drafts of the IBP were distributed to the IBG for review. Finalisation of the document involved the endorsement of the plan by AHBIC and PHC (as of 21 December 2012 final endorsement from remaining PHC members is required before PHC endorsement) during December 2012.

Information taken from the Honey Bee IBP has been used to form the basis for the Biosecurity Manual for the Honey Bee Industry. This manual takes the findings from this industry level plan into plain English and translates it into an easy to read, practical and pictorial guide on what beekeepers can do to protect their honey bees, their livelihoods and the industry as a whole.

Once the Biosecurity Manual was finalised and endorsed through the IBG, specific sections of the manual (and photos) were adapted to the BOLT module.

The four pest specific Contingency Plans which covered Varroa mites (*Varroa destructor* and *V. jacobsoni*), Tropilaelaps mites (*Tropilaelaps clareae* and *T. mercedesae*), Tracheal mite

(*Acarapis woodi*) and Braula fly (*Braula coeca*) were also distributed to the IBG consideration. These documents were finalised in December 2012.

5. Results

The Honey bee IBP was endorsed by the Australian Honey Bee Industry Council (AHBIC) in December 2012. Endorsement of the Honey bee IBP by the Australian government and all state and territory governments through Plant Health Committee (PHC) is underway (and as of 20 December 2012 waiting final endorsement from the remaining PHC members). PHA is currently in negotiation with AHBIC about a formal release date, with the 100th Conference of the New South Wales Apiarists Association in May 2013 currently looking most likely for the formal launch date. A joint media release between PHA and AHBIC will be produced for the launch. Once endorsement is complete the Honey bee IBP (Version 1.0-2012) will be available by request from PHA and AHBIC.

The Biosecurity Manual was successfully received by both commercial and hobby beekeepers. PHA worked with two notable honey bee industry organisations, namely the When Bee Foundation and the Federal Council of Australian Apiarists' Associations (FCAAA) and raised an additional \$60,000 for the printing and distribution of 13,000 biosecurity manuals to every registered beekeeper in Australia. There has been an incredibly positive response to this manual, with very encouraging feedback coming from beekeepers around Australia. There has also been large media coverage regarding the production of this manual through DAFF Media, PHA media, CoxInall and other avenues, with over 20 media events, including radio interviews, manual press releases, 3rd party mention and in industry journals occurring.

The content of the Biosecurity Manual was adapted for the Biosecurity Online Training (BOLT) module. The module contains information on how to keep honey bees healthy, how to inspect hives, incorporating surveillance methods into apiary health surveillance programs as well as guidelines on product management, regional hive movements, and reporting suspect pests or symptoms. At the end of the BOLT module, a quiz containing 15 multiple choice questions is included so that beekeepers, or anyone interested in keeping honey bees, could assess their understanding of honey bee biosecurity.

The four Contingency Plans which covered Varroa mites (*Varroa destructor* and *V. jacobsoni*), Tropilaelaps mites (*Tropilaelaps clareae* and *T. mercedesae*), Tracheal mite (*Acarapis woodi*) and Braula fly (*Braula coeca*) were finalised in December 2012.

The Honey bee IBP and Biosecurity Manual are available by request from PHA. The Biosecurity Manual, a print out of the BOLT module and the four pest specific Contingency Plans have been provided as attachments.

Implementation of actions identified within the “Honey Bee Industry and Pollination Continuity Strategy for Australia”

As part of this project PHA has played a major facilitative role working closely with all industry and government stakeholders. A key activity within this project was to commence implementation of several actions identified with this continuity strategy.

Of the 11 action items summarised in the continuity strategy the project team identified five actions where implementation activities would commence with the remaining six actions outside the scope of this project (for more details see project proposal and contract).

Action 1: Progress and maintain the provisional registration of key chemicals for the treatment of Varroa, Tropilaelaps and Tracheal mites

Within each Contingency Plan, information on chemicals most commonly used for control of each pest has been included. Information on chemicals status in Australia and whether a permit exists have also been provided. If a permit exists for a specific pest (e.g. Varroa mites) but is not extended for use on another pest (e.g. Tracheal mite), it has clearly been stated that an extended use for the current permit will be required from the APVMA in the event of an incursion.

PHA will be working with DAFF and APVMA in 2013 to renew expired chemical permits as well as the possibility of extending their registered use to other honey bee pests. This information will be included in the review of the Contingency Plans in late 2013.

Action 2: Industry and government should conduct training workshops for apiarists in Integrated Pest Management practices, chemical handling and other matters related to treatment of Varroa mite.

The Biosecurity Manual and BOLT module developed as part of this project outline biosecurity practices and best management practices. These resources for beekeepers provide the opportunity for early detection of bee pests, minimise the spread of potential pest incursions, promote and outline hygiene methods and basic awareness of 13 priority established and exotic pests to the honey bee industry.

PHA will also be including this information in face-to-face training exercises in conjunction with Industry Liaison Officer Workshops in 2013, due to requests from various beekeeping organisations in Australia.

The development of training modules and workshops for beekeepers in integrated pest management and chemical handling were outside the scope of this project.

Action 4: Government and industry should develop pollination management training materials and quality assurance standards

As described above, the BOLT module and the Biosecurity Manual outline the importance of biosecurity. These resources for beekeepers also provide guidelines for implementing best management practices for beekeepers providing pollination services.

As part of this project, PHA developed Biosecurity signs for apiaries and are currently in negotiation with major pollinator organisations in Australia regarding the inclusion of these signs with the movement of hives, and at major pollination sites (i.e. Almond pollination at Robinvale). These signs have been distributed to the Crop Pollination Association Inc. and the New South Wales Department of Primary Industries.

Action 8: Develop in-principle arrangements and guidelines on the delineation of control and management zones that optimise the objectives of controlling the spread of Varroa and minimising the disruptions to pollination responsive industries

Information on control and management zones has been included in each of the four pest specific Contingency Plans. Unfortunately, the Varroa Strategy Management Committee has been unable to implement draft ICA's in 2012. Consequently, as yet, no information on ICA's have been included in the Contingency Plans.

In 2013 PHA will be preparing a report for the National Biosecurity Committee outlining recommendations from the Varroa Continuity Strategy regarding the development and guidelines on the delineation of control and management zones in the event of a honey bee EPP incursion. These recommendations will be included in the review of the Contingency Plans in late 2013.

Action 9: Develop a detailed 'transition to management' plan

PHA will be preparing a Varroa transition to Management Plan (V T2M) as part of the Varroa Continuity Strategy. This V T2M will be included in the Varroa Contingency Plan in late 2013.

As stated above, PHA has agreed to review the four pest specific Contingency Plans completed as part of this project in late 2013, for inclusion of specific detail that will be completed as part of the Varroa Continuity Strategy.

6. Discussion

Industry biosecurity is a core component in developing a world class, nationally coordinated plant health system. IBPs provide each industry with a road map to better biosecurity.

The honey bee industry worked with PHA to:

- identify and document the key biosecurity threats
- commence the process of conducting appropriate pest risk assessments
- develop an agreed high priority pest (HPP) threat list
- develop a basic Industry Risk Mitigation Plan
- develop a Biosecurity Manual for the Honey Bee Industry
- develop a Biosecurity Online Training (BOLT) module
- develop four pest specific Contingency Plans which covered Varroa mites (*Varroa destructor* and *V. jacobsoni*), Tropilaelaps mites (*Tropilaelaps clareae* and *T. mercedesae*), Tracheal mite (*Acarapis woodi*) and Braula fly (*Braula coeca*).

Benefits of this project

For biosecurity to be truly effective in Australia it must be a whole of industry, government and community approach. The development of the Honey bee IBP is the first step for industry and plays an important role in building partnerships between all parties on matters of biosecurity.

The benefit of an IBP includes:

- aligns the honey bee industry nationally with PHA, its plant pest members and the Emergency Plant Pest Response Deed (EPPRD)
- development of priority pest lists for risk based investment in biosecurity
- development of comprehensive knowledge on the current state of biosecurity for that industry, and gaps identified
- preparation of an Action list for future biosecurity needs for that industry
- the identification and documentation of industry threats
- the identification of industry risk mitigation activities, contingency plans and awareness material
- agreeing on, and documenting the roles and responsibilities of stakeholder groups
- identification of appropriate communication and consultation strategies.

An IBP not only brings together current biosecurity activities and processes relevant to the honey bee industry but it also identifies the current gaps. This enables resources to be used where there is the greatest need and allows a common platform for collaboration on biosecurity matters.

The benefits of improved biosecurity through the implementation of tools such as the IBP and the Biosecurity Manual for the Honey bee Industry are valuable, and include:

- potential early detection of key pest threats through improved awareness and knowledge of these threats
- development of effective and efficient biosecurity programs
- optimising resources
- government and industry ownership of decisions, and a commitment to delivering real outcomes
- the capacity to examine biosecurity arrangements and activities across the honey bee industry
- provision of plain and practical advice for commercial and hobby beekeepers in the Biosecurity Manual for the honey bee industry on how best to protect their honey bees, their livelihoods, and industry as a whole from high priority exotic and established pests, to prepare for incursions and minimise their potential impact.

The development of biosecurity plans also assists in the prioritisation and co-ordination of research projects to be considered for investment in the area of plant health. The actions identified in the Biosecurity Actions list include:

- Improve legislation between states and territories relating to the control and management of American Foulbrood, and investigate the possibility of a national management strategy.
- Develop workshops through the provision of honey bee training material (e.g. Biosecurity Manual for the Honey Bee Industry).
- Develop training courses for beekeepers in the use of chemicals for management of HPPs.
- Develop molecular tests for pest bees and bee pests e.g. Africanized honey bees (*Apis mellifera scutellata*) and Tracheal mite (*Acarapis woodi*).
- Identify chemical control requirements for high priority pest threats and their availability in Australia. Where required, advanced applications for emergency chemical permits / registrations or shelf registrations prepared and submitted to the APVMA.

- Undertake surveys to determine the presence or absence of honey bee viruses in European honey bee (*A. mellifera*) in Australia.
- Undertake a national survey to estimate the density and distribution of feral honey bees in Australia.
- Improve legislation in states and territories relating to the destruction of abandoned and neglected apiaries to aid in limiting the spread of pests.
- Develop models to estimate the spread of high priority exotic bee pests in Australia.
- At an industry level, create a checklist of roles for individual industry members in the event of an incursion. At a regional level, identify the possibility of training Industry Liaison Officers (ILOs) in emergency response responsibilities should an incursion occur.

When coupled with the high priority pest list, this Action list can assist to better identify projects and direct investment in biosecurity for the honey bee industry.

7. Technology transfer

The primary (but not sole) audiences of the IBP are industry leaders and government officials. These industry groups were informed of progress during this project via participation in IBP development and endorsement. PHA has also used other networks (training and participation at relevant forums, such as government committees) to promote the awareness and implementation of biosecurity activities and projects and recommendations identified throughout the IBP.

The audiences of the Biosecurity Manual for the honey bee industry are both commercial and hobby beekeepers. PHA worked with two notable industry organisations, namely the When Bee Foundation and the Federal Council of Australian Apiarists' Association (FCAAA) and raised an additional \$60,000 for the printing and distribution of 13,000 manuals to every registered beekeeper in Australia. There has been an incredibly positive response to this manual, with very encouraging feedback coming from beekeepers from around Australia.

The information contained in this Biosecurity Manual has now been adapted to the joint AHA/PHA Farm Biosecurity Website, the PHA website, the BOLT module, as well as PHA media articles.

8. Recommendations

The development of the Honey bee IBP, Biosecurity Manual for the Honey bee Industry, four pest specific Contingency Plans and the Biosecurity Online Training (BOLT) module have provided a blueprint for biosecurity requirements within the honey bee industry. Further work is needed to implement the IBP and manual including:

- development of diagnostic protocols for High Priority Pests (HPPs).
- development and delivery of awareness material to provide information on apiary biosecurity, honey bee health, key pest threats and surveillance practices.
- promotion of biosecurity training and awareness packages available to the honey bee industry to increase awareness of both commercial and hobby beekeepers.

9. Acknowledgements

PHA would like to acknowledge the significant contribution of those involved with the development of the IBP, Biosecurity Manual for the honey bee industry, four pest specific contingency plans and the Biosecurity Online Training Module (BOLT), including in-kind support from the following:

- Australian Honey Bee Industry Council
- Research experts from state government agencies (Vic, SA, WA, Qld, NSW, NT, Tas) who provided significant support in assessment of the TSTs and key priority pests;
- PHA Membership;
- CSIRO
- University of Sydney
- Rural Industries Research and Development Corporation
- Horticulture Australia Ltd
- Sharyn Taylor, Plant Biosecurity CRC.