

Final Report

Review of national biosecurity plans

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Delivery partner:

Plant Health Australia

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Review of national biosecurity plans (MT17003)

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Public summary

Australia's freedom from many of the exotic pests that affect production overseas provides both the avocado and mango industries with potential advantages in production yield, quality, and trade. Biosecurity planning provides a mechanism for the avocado and mango industries, governments, and other stakeholders to assess current biosecurity practices and future biosecurity needs. The identification, prioritisation, and management of key biosecurity risks, through development and implementation of a biosecurity plan for each industry are critical industry biosecurity preparedness activities. When coupled with Avocados Australia Limited (AAL) and the Australian Mango Industry Association (AMIA) being Plant Health Australia (PHA) members and signatories to the Emergency Plant Pest Response Deed, biosecurity planning provides the avocado and mango industries with the framework for risk mitigation and management of the impact of potential incursions.

Technical summary

For the review of the existing biosecurity plans and development of new Biosecurity Plans for the avocado and mango industries:

- Avocado and Mango industry members and scientific experts met via separate teleconferences to identify high priority pests (exotic and established) for each industry
- post border biosecurity capability assessments were undertaken for all high priority pests to inform the development of the biosecurity implementation tables of activities to mitigate risk and prepare for response (undertaken by Plant Health Australia in consultation with industry and government)
- a shared approach to implementing the biosecurity plans was developed through meetings of the Biosecurity Implementation Groups (BIG) comprising industry representatives and technical experts and the relevant delegates of the State Plant Health Managers

The Biosecurity Plan for the Avocado industry (v3.0) was published in January 2020, and the Biosecurity Plan for the Mango industry (v3.1) was published in September 2019 following endorsement by the industry and Plant Health Committee (PHC).

This project also facilitated the avocado and mango Biosecurity Reference Panels (BRP) with regular meetings held during the life of the project. The purpose of the BRP meetings was to review the plans regularly to ensure information contained in the plans was current and amended when appropriate. The BRPs also monitored the progress of actions outlined in each of the BPs. Through the life of the project the biosecurity plans for both avocados and mangoes had minor amendments, with most amendments focused on updates to the Implementation Table within each plan. The most recent version of the Avocado Biosecurity Plan is version 3.3 and the most recent version of the Mango Biosecurity Plan is version 3.2.

Keywords

avocados, mangoes, biosecurity plans, exotic pests, risks, preparedness

Introduction

The Australian avocado and mango industries are free from a range of exotic pests and diseases, which have the potential to cause significant impact on production if they were present. Both industries are focused on building their export markets, and it is important the industries maintain their freedom from a range of exotic pests as well as being able to manage and monitor key established pests. Maintenance of their plant health status is important to ensure the sustainability of the industries. Biosecurity planning is a key risk mitigation strategy that gives the industry the best opportunity of future viability and sustainability. This project will review the biosecurity plans of both industries.

The review and development of these new biosecurity plans provides the opportunity to bring both industries and government together in a collaborative framework where knowledge and ideas are freely shared. As a part of this project, exotic pests (invertebrates and pathogens) are regularly assessed by technical experts and prioritised to identify high priority exotic pests, as well as established pests and weeds of biosecurity significance. Having identified the pests that pose the greatest threat to the industries, expert groups were convened from government and industry to agree to mitigation measures to protect against them. These biosecurity plans have been reviewed regularly over the life of the project through the efforts of the Avocado and Mango Biosecurity Reference Panels (BRP).

Methodology

The Avocado and Mango Biosecurity Plans have been developed based on National Industry Biosecurity Guidelines developed by PHA and are consistent with other biosecurity plans developed or reviewed recently. Additions or modifications to the generic template were determined through the development process in consultation with industry and government.

The Avocado and Mango Biosecurity Plans cover the following topics:

- Threat Summary Tables - list of exotic pests (invertebrates and pathogens) and high priority pests
- Established pests of biosecurity significance
- Preparedness status – identification of documents prepared, and activities implemented to improve preparedness for exotic pests
- Biosecurity Implementation Plan - describes current and future preparedness and response activities

The process of reviewing and developing these BPs involved:

1. Identification of representatives from the avocado and mango industries, governments, and scientific experts to form Technical Expert Groups (TEG) to consider risks associated with exotic and established pests of biosecurity significance.
2. Compilation and review of exotic pest threats to avocados and mangoes into Threat Summary Tables.
3. Development of High Priority Pest (HPP) lists from the Threat Summary Tables. The HPP lists are developed based on the assessment by the TEGs on the entry potential, establishment potential, spread potential and economic impact of each exotic pest. These ratings are then assessed to provide an overall risk rating. Generally, those pests with a high or extreme overall risk rating are included in the list of HPP's.
4. Analysis of biosecurity capacity for each high priority pest in terms of both preparedness and response.
5. Development and review of core components of the biosecurity plans by PHA, in association with the Biosecurity Implementation Groups (BIG). These components include the HPP lists, lists of established pests and weeds, Biosecurity Implementation Plan, and the Preparedness status, which identifies available resources and gaps in resources.
6. Development of a shared approach to implementing biosecurity through meetings of Biosecurity Implementation Groups (BIG) for the avocado and mango industries, comprising industry and state/territory government representatives.
7. Endorsement of the biosecurity plans by the industries (the Avocado BP through Avocados Australia Limited and the Mango BP through the Australian Mango Industry Association, and government, through the Plant Health Committee (PHC).
8. Launch at an appropriate industry event, supported by media releases.
9. Review of implementation activities by industry and state government representatives through the biosecurity reference panel process. Biosecurity Reference Panel meetings will be held to review emerging pests, determine biosecurity priorities, and monitor activities recommended in both biosecurity plans.

The project will link into the Biosecurity Preparedness Portal which was developed by PHA. The Avocado and Mango industries will have a site within the portal which will act as a repository for the:

- Biosecurity plan
- High priority pest list
- Biosecurity implementation plan

- Preparedness status table
- Established pests of biosecurity significance

The Biosecurity Preparedness Portal is an on-line support tool that will assist in coordinating and monitoring the activities of each Biosecurity Reference Panel.

Consultation with each industry, government departments and scientific experts was sought throughout the development process to ensure that stakeholders have input into the document. Members of both the Avocado and Mango Technical Expert Groups, Biosecurity Implementation Groups and Biosecurity Reference Panels are included in the tables below.

Table 1. TEG and BIG members for the review of the Avocado Biosecurity Plan.

NAME	ORGANISATION	AREA OF EXPERTISE	MEMBER OF		
			TEG	BIG	BRP*
Dudley Mitchell	Avocados Australia	Industry	✓	✓	✓
Tom Silver	Avocados Australia	Industry	✓	✓	✓
John Tyas	Avocados Australia	Industry	✓	✓	✓
Amanda Kobelt	Ag Vic	Entomology	✓		
Elizabeth Minchinton	Ag Vic	Pathology	✓		
Corrine Jasper	Hort Innovation	RD&E		✓	
Penny Measham	Hort Innovation	RD&E	✓		
Greg Chandler	Hort Innovation	RD&E			✓
Pip Cotter	NSW DPI	Industry Extension		✓	
Rebekah Pierce	NSW DPI	Industry Extension		✓	✓
Jo Lee	PHA	Biosecurity	✓	✓	✓
Rodney Turner	PHA	Biosecurity		✓	
Trevor Dunmall	PHA	Biosecurity			✓
Bridie Carr	QDAF	Industry Extension	✓		
Lindy Coates	QDAF	Pathology	✓		✓
Christine Horlock	QDAF	Pathology	✓	✓	✓
Simon Newett	QDAF	Industry Extension	✓		✓
Ian Newton	QDAF	Entomology	✓		✓
Elizabeth Dann	University of Queensland	Pathology	✓	✓	✓
Andrew Geering	University of Queensland	Virology	✓		✓
Louisa Parkinson	University of Queensland	Pathology	✓		✓
Alison Mackie	WA DPIRD	Industry	✓		✓
Declan McCauley	WA DPIRD	Industry	✓		✓

*Membership of the BRP changed during the life of the project, subject to availability

Table 2. TEG and BIG members for the review of the Mango Biosecurity Plan.

NAME	ORGANISATION	AREA OF EXPERTISE	MEMBER OF		
			TEG	BIG	BRP*
Marine Empson	AMIA	Industry		✓	✓
Paige Liebich	AMIA	Industry			✓
Samantha Frolov	AMIA	Industry	✓	✓	✓
Robert Gray	AMIA	Industry	✓	✓	✓
Matt Hall	NT DPIF	RD&E		✓	
Jose Liberato	NT DPIF	Pathology		✓	
Brian Thistleton	NT DPIF	Entomology	✓	✓	✓
Lucy Tran-Nguyen	NT DPIF	Pathology		✓	✓
Sharl Mintoff	NT DPIF	Pathology			✓
Jose Liberato	NT DPIF	Pathology	✓		✓
Anne Walters	NT DPIF	Biosecurity		✓	
Rebekah Pierce	NSW DPI	Extension		✓	✓
Matt Weinert	NSW DPI	Extension		✓	✓
Greg Owens	NT Farmers	Industry		✓	✓
Corrine Jasper	Hort Innovation	RD&E		✓	
Penny Measham	Hort Innovation	RD&E		✓	
Greg Chandler	Hort Innovation	RD&E			✓
Rosalie Banks	QDAF	Biosecurity		✓	
Stefano De Faveri	QDAF	Entomology	✓	✓	✓
Geoff Dickinson	QDAF	Horticulture	✓	✓	✓
Ebony Faichney	QDAF	Horticulture		✓	✓
Ceri Pearce	QDAF	Biosecurity			✓
Kathy Grice	QDAF	Pathology	✓	✓	
Christine Horlock	QDAF	Biosecurity	✓	✓	✓
Ian Newton	QDAF	Entomology	✓	✓	✓
Peter Trevorrow	QDAF	Pathology	✓	✓	
Hadley Keast	QDAF	Biosecurity			✓
Kaylene Bransgrove	QDAF	Pathology			✓
Kyra Murray	PHA	Biosecurity			✓
Andrew Vossen	PHA	Biosecurity			✓
Trevor Dunmall	PHA	Biosecurity	✓	✓	✓
Victoria Ludowici	PHA	Biosecurity		✓	✓
Jessica Bennington	WA DPIRD	Biosecurity		✓	
Alison Mackie	WA DPIRD	RD&E	✓	✓	
Fucheng Shan	WA DPIRD	RD&E			✓
Marc Poole	WA DPIRD	Entomology		✓	✓
Touhidur Rahman	WA DPIRD	Entomology	✓	✓	✓
Tara Slaven	WA DPIRD	Extension		✓	
Helen Spafford	WA DPIRD	Entomology			✓

*Membership of the BRP changed during the life of the project, subject to availability

Results and discussion

This project has provided the avocado and mango industries and government with a new Biosecurity Plan for the Avocado industry and a new Biosecurity Plan for the Mango industry. The key components of the biosecurity plans are the Threat Summary Tables which form the basis for the development of the high priority pest list and the Biosecurity Implementation Plan which describes the current and planned preparedness activities and forms a core component of the biosecurity plan.

The processes used in the development of biosecurity plans is important and the foundation of each biosecurity plan is the Threat Summary Table (TST) which describes the known exotic pests of each industry. The information contained in the TST includes:

- the list of hosts – which has potential implications for the entry, establishment and spread of a pest
- the part of the plant affected – which has potential implications on yield, quality, and trade/market access
- means of movement and dispersal – implications for establishment and spread (distance and time)
- geographic distribution – implications for entry and spread
- vectors present - knowledge of known and potential vectors which may have implications for entry, establishment and spread of a pest, in particular pertinent to some pathogens

This information and the knowledge of technical experts informs the discussion on the appropriate ratings to be applied to the entry potential, establishment potential and spread potential. The ratings applied to the potential economic impact are based on both technical and industry knowledge of the crop and pest.

These four ratings are used to establish the overall risk each pest poses to the crop and industry and the pests which pose the highest risk are termed the high priority pests. These are the pests which are usually the focus for biosecurity.

The implementation plan describes the activities the industry and government plan to implement to strengthen biosecurity preparedness and response capacity and capability.

While the development of the biosecurity plan is a fundamental need for each industry, the strength of the biosecurity planning processes come from the shared approach by industry and government. Ideally the plan should be used to guide future biosecurity activities, ranging from communication and engagement to RD&E. Both the avocado and mango industries have used their respective biosecurity plans to underpin industry and government biosecurity activities.

Outputs

Table 3. Output summary

Output	Description	Detail
Biosecurity Plan for the Avocado industry (versions 3.0, 3.1, 3.2, 3.3)	Biosecurity Plans are developed for the use primarily by the industry organisation and governments	The Biosecurity Plan was developed in the first year of the project. Following this each year the Biosecurity Reference Panel would meet to review the plan. If there were amendments made, then a revised version of the plan was produced.
Biosecurity Plan for the Mango industry (versions 3.0, 3.1, 3.2)	Biosecurity Plans are developed for the use primarily by the industry organisation and governments	The Biosecurity Plan was developed in the first year of the project. Following this each year the Biosecurity Reference Panel would meet to review the plan. If there were amendments made, then a revised version of the plan was produced.

Outcomes

Table 4. Outcome summary

Outcome	Alignment to fund outcome, strategy and KPI	Description	Evidence
Identification of the range of exotic pests of avocados	OUTCOME 2: Industry supply, productivity, and sustainability The Australian avocado industry has improved profitability, efficiency and sustainability through globally competitive production systems, orchard management, varieties, innovative R&D and sustainable BMPs. Strategy 4: Develop and optimise fit for purpose pest and disease management strategies KPI: Crop loss reduced by sustainable pest and disease practices	The identification of the exotic pests of avocados was undertaken through a literature search, followed by input from a technical expert group with members experienced in avocado entomology and pathology.	Participation and informal feedback from industry and governments through the life of the project
Implementation of risk mitigation activities to increase the avocado industries preparedness and response capabilities	As above	The development of risk mitigation measures was undertaken through a consultative process which focused on the development of biosecurity priorities and activities to improve	As above

		preparedness and capacity/capability with input from a biosecurity implementation group comprising of members experienced in avocado production and biosecurity	
Regular reviews and updating of the avocado biosecurity plan	As above	The review of the biosecurity plan and its components was undertaken through a consultative process which focused on ensuring information of important pests was maintained and planned activities monitored. This was undertaken by a biosecurity reference panel comprising of members experienced in avocado production, biosecurity, entomology, and pathology	As above
Identification of the range of exotic pests of mangoes	OUTCOME 2: Industry supply, productivity, and sustainability The Australian mango industry has increased profitability, efficiency, and sustainability through innovative R&D, sustainable BMPs and pollination. Strategy 3: Improve on-farm practices and enhance industry biosecurity KPI: Increased resilience to exotic biosecurity threats	The identification of the exotic pests of mangoes was undertaken through a literature search, followed by input from a technical expert group with members experienced in mango entomology and pathology.	Participation and informal feedback from industry and governments through the life of the project
Implementation of risk mitigation activities to increase the avocado industries preparedness and response capabilities	OUTCOME 2: Industry supply, productivity, and sustainability The Australian mango industry has increased profitability, efficiency, and sustainability through innovative R&D, sustainable BMPs and	The development of risk mitigation measures was undertaken through a consultative process which focused on the development of biosecurity priorities and activities to improve preparedness and capacity/capability with	As above

	pollination. Strategy 3: Improve on-farm practices and enhance industry biosecurity +KPI: Increased resilience to exotic biosecurity threats	input from a biosecurity implementation group comprising of members experienced in mango production and biosecurity	
Regular reviews and updating of the mango biosecurity plan	As above	The review of the biosecurity plan and its components was undertaken through a consultative process which focused on ensuring information of important pests was maintained and planned activities monitored. This was undertaken by a biosecurity reference panel comprising of members experienced in mango production, biosecurity, entomology, and pathology	As above

Monitoring and evaluation

Table 5. Key Evaluation Questions

Key Evaluation Question	Project performance	Continuous improvement opportunities
To what extent has the project achieved its expected outcomes?	The project achieved its outcomes by developing new Biosecurity Plans for the Avocado and Mango industries which were reviewed annually and updated as necessary	As the threats posed by exotic pests change through movement across hosts and/or geographic distribution, the importance to regularly monitor and update biosecurity plans remains important
How relevant was the project to the needs of intended beneficiaries?	Biosecurity planning is important to provide industry and government with the information to plan preparedness and response activities pertinent to the priority exotic pests	As industry and government resources are under pressure it becomes more imperative to continue to review the processes used in developing biosecurity plans. PHA is regularly reviewing aspects of biosecurity planning to account for the changing dynamics of pest/host interactions while gaining industry and government input through efficient and effective methods
How well have intended beneficiaries been engaged in the project?	The intended beneficiaries (industry and government) have been engaged throughout the life of the project and play an important role in providing both technical and industry information to the project	The intended beneficiaries have been engaged through the life of the project. Travel restrictions due to Covid 19 have limited the number of face-to-face meetings, but the use of videoconferencing has been an effective method of engagement.
To what extent were engagement processes appropriate to the target audience/s of the project?	The engagement process is appropriate to the target audience (industry organisations and governments)	Engagement processes are appropriate, but the Covid 19 travel restrictions did impact on the quality of engagement. In the future (without travel restrictions), a blended approach of face to face and videoconference meetings should be planned.
What efforts did the project make to improve efficiency?	The development of biosecurity plans is undergoing a cycle of continuous improvement, both to the process used in developing and reviewing the plans and in ensuring the content of the plan is relevant.	Regular engagement with industry, government and research funders should be encouraged to gain their input into process improvement.

Recommendations

1. PHA continues to work with Hort Innovation and the avocado and mango industries to monitor industry biosecurity preparedness and develop a long-term plan to deliver enhanced biosecurity preparedness to industry.
2. PHA to continue to review planning processes to enable agile adaptation of processes to industry and government needs and resource availability.

Intellectual property

No project IP or commercialisation to report.

Acknowledgements

The project team would like to acknowledge the contributions of members of the Technical Expert Groups, the Biosecurity Implementation Groups, and the Biosecurity Reference Panels. These people have contributed to improving the avocado and mango industry's biosecurity preparedness and therefore are contributing to a sustainable future for Australian avocado and mango growers.