

# Plant Biosecurity Research Initiative Strategy 2018-2023



PLANT BIOSECURITY  
RESEARCH INITIATIVE





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# Plant Biosecurity Research Initiative at a glance

## Purpose

To foster coordination and collaboration for targeted investment in high value, cross-sectoral, plant biosecurity research, development and extension (RD&E)

## Vision

To support excellence in cross-sectoral plant biosecurity RD&E to protect Australia’s plant industries in a highly responsive manner, with benefit to the environment and regional communities.

## Our Principles

- Strong leadership
- Impact and uptake
- Collaboration
- Responsiveness
- Good governance
- Fit-for-purpose
- Innovative and high-quality science
- Building capability
- Financial effectiveness

## Stakeholders and Investors

- PBRI member organisations
- Plant industries, peak industry bodies and growers
- Regional communities
- Australian Government
- State government biosecurity agencies
- National extension networks
- National plant biosecurity committees
- Researchers

## Strategic Goals

- **Goal 1:** Identification of targeted cross-sectoral plant biosecurity innovation for co-investment.
- **Goal 2:** Responsive coordination and leveraging high value cross-sectoral investment in plant biosecurity innovation.
- **Goal 3:** Promotion and facilitation of collaboration for better plant biosecurity outcomes for industry, their communities, and the environment.

## Scope

RD&E that minimises the impact of damaging endemic and exotic pests, diseases and weeds that affect Australia’s plant industries, community, and the environment.

## Key Focus Areas

- Preparedness
- Diagnostics
- Surveillance
- Pest management
- Capability building
- Industry resilience

# About the strategy

The Plant Biosecurity Research Initiative (PBRI) Strategy provides a high-level framework and direction for coordinating cross-sectoral priorities for national plant biosecurity RD&E.

The Strategy outlines PBRI’s purpose, vision, goals, investment model and a set of Key Focus Areas for activities from 2018-2023. PBRI activities aim to protect Australia’s plant production industries with benefits to regional communities, the economy, and the environment.

This document represents a mid-term review of the 2018-2023 Strategy, re-setting our direction and building on the successful collaboration model that minimises duplication in plant biosecurity RD&E investment.

## Improved Research Coordination

The case for change in the Australian biosecurity research landscape was defined by the need to coordinate often fragmented or replicated investments in biosecurity research across plant industries. In 2017, the Intergovernmental Agreement on Biosecurity (IGAB) Review highlighted the lack of a coordinating body for research and innovation, particularly in cross-sectoral biosecurity research.

Through this Strategy, and in working with our plant industry and research partners, the PBRI will continue to deliver efficiencies in plant biosecurity RD&E through strong leadership, national and international collaboration, and better coordination of existing resources.

The PBRI represents a coherent system for setting, reviewing, and funding biosecurity research priorities across plant industries. Importantly, it also provides a process for the assessment and distribution of RD&E findings in plant biosecurity.

The primary target audience for PBRI is a cohort of ten member organisations, plant industry bodies and growers, regional communities, the Australian Government, PBRI member extension networks and external co-investors, plant biosecurity committees, state governments and research providers.

## Measures of Success

Our measures of success will be in the demonstration of achieving our three strategic goals.

- **Goal 1:** Identification of targeted cross-sectoral plant biosecurity innovation for co-investment.
- **Goal 2:** Responsive coordination and leveraging high value cross-sectoral investment in plant biosecurity innovation.
- **Goal 3:** Promotion and facilitation of collaboration for better plant biosecurity outcomes for industry, their communities, and the environment.

An investment plan for 2020-2023 has been developed to support the implementation of Goal 1 and Goal 2. An accompanying ‘Monitoring and Evaluation Framework’ will measure achievements against the Strategy.



Photo: Department of Agriculture, Water and the Environment.



# Background

Agriculture is an integral part of Australia’s economy, with plant production industries contributing over \$33 billion in 2017–18.

Minimising the loss of production and markets caused by biosecurity threats such as insects, pathogens and weeds is a key focus for government, plant industries, Plant Health Australia and the Research and Development Corporations (RDCs).

In Australia, plant biosecurity is underpinned by science and innovation supported with investment made by the RDCs, the states and territories and the Australian Government Department of Agriculture, Water and the Environment. Australian science agencies also invest in plant biosecurity research through in-kind capability and cash resources.

With multiple organisations investing in plant biosecurity research, an ideal scenario would be to collaborate and combine resources to achieve greater efficiency and impact. The RDCs alone invested \$135 million in single-industry issue plant biosecurity research in 2018-2019.

## PBRI Collaboration

The PBRI represents a collaboration between Australia’s seven plant RDCs, Plant Health Australia, the Department of Agriculture, Water and the Environment, and the Council of Rural RDCs, with a specific focus on coordinating plant biosecurity research. An agreement was signed in January 2018 for an initial three-year program.

The PBRI Strategy and Investment Plan provided a national framework outlining priority areas for collaboration and co-investment activities.

- Examples of PBRI projects so far include:
- A Xylella (*Xylella fastidiosa*) coordinator position
  - Rural R&D for Profit projects - iMapPESTS and national diagnostic capability building
  - Post entry quarantine diagnostics

**\$50 million**

### 15 PROJECTS

In Phase I of the PBRI (2017-2020), there were fifteen successful collaborative projects coordinated and contracted through PBRI members, with a total value of \$50 million (cash and in-kind).

- eDNA detection of Brown Marmorated Stink Bug (BMSB)
- Coordination of the 2020 International Year of Plant Health
- PBRI Symposium

An independent review was undertaken in April 2020 to assess the progress of the PBRI and to consider any improvements to the model. This review, by RM Consulting Group Pty Ltd (RMCG), found the PBRI plays an important role in brokering and facilitating collaboration, project concepts and investment. Critical to PBRI’s success has been a collaborative model, with the review finding that PBRI had:

- The right people at the table with strong connections
- Strong relationships built on trust
- A high degree of commitment and good will
- Recognition that collaboration will result in better outcomes

The review outlined recommendations to support the strengthening and sustainability of the PBRI to support biosecurity RD&E into the future. These recommendations have been incorporated into the Strategy and the governance of PBRI.

In 2020, the PBRI Collaboration Agreement was renewed for a further three years (2020-2023), building on the initial establishment phase.

## Collaborative Model

An independent review found that the PBRI plays an important role in brokering and facilitating collaboration, project concepts and investment.

- The right people at the table with strong connections
- Strong relationships built on trust
- A high degree of commitment and good will
- Recognition that collaboration will result in better outcomes

RM Consulting Group, April 2020





Photo: Ian Routledge/  
Wine Australia.

# About us

## Purpose

The purpose of the PBRI is to foster coordination and collaboration for targeted investment in high value, cross-sectoral plant biosecurity RD&E.

The continued collaboration and investment in cross-sectoral RD&E will contribute to a strong biosecurity system that will:

- Prepare and prevent pests, diseases and weeds entering Australia
- Accurately detect and diagnose the biosecurity threat with assurance
- Quickly respond to minimise the damage caused by pests before widespread damage occurs
- Provide intelligence and quality assurance to maintain and grow market access
- Protect Australia’s unique biodiversity, ecosystems, natural resources and landscapes

## Vision

To support excellence in cross-sectoral plant biosecurity RD&E to protect Australia’s plant industries with benefit to the environment and regional communities.

## Member Organisations

The members of the PBRI are key to its collaborative success. Current members are representative of a diversity of plant industries:





















Tasmanian grower Rob Terry on a quest to find Australia’s highest wheat yields. Photo: GRDC.

Oversight and ownership of the Strategy rests with the Management Committee which includes a representative member from each organisation. To further support Australia’s plant biosecurity, each PBRI member organisation includes plant biosecurity in their strategic plans.



# PBRI Principles

 <p><b>Leadership</b> The PBRI will provide leadership and coordination to ensure research is well-targeted and innovative. It will coordinate the long-term investment in new knowledge and skills across plant industries leading to greater investment efficiency, with RD&amp;E outcomes shared across industries.</p>	 <p><b>Impact and Uptake</b> The PBRI will demonstrate value-for-money to investors and stakeholders with benefits that flow on to plant industries and regional communities. Impact will be generated through leveraging investments, better coordination of research priorities, and the adoption of a plant biosecurity research outputs. PBRI research projects are developed in alignment with stakeholder priorities with sufficient input into project design from the end-users of the research to ensure a pathway for uptake. The impact of PBRI RD&amp;E will be clearly communicated to all stakeholders.</p>	 <p><b>Collaboration</b> Strategic collaboration will be established through MOUs with national and international organisations to avoid duplication of research and to share biosecurity knowledge for the benefit of Australian agriculture and the environment. International connectivity is an essential part of an effective plant biosecurity system to ensure access to the latest knowledge, technology, and capability. Through its extensive international collaborations, PBRI members and their research providers have an extensive network of biosecurity practitioners throughout the world.</p>	 <p><b>Governance</b> PBRI will operate under best practice governance with a focus on purpose, transparency of process and responsiveness. RD&amp;E that is aligned to PBRI strategy and identified as a priority to two or more RDCs will be procured in accordance with the lead RDCs governance and accountability processes. A Chair and Deputy Chair preside over the Management Committee on a quarterly rotating basis.</p>	 <p><b>Fit-for-purpose, Innovation and High Quality Science</b> The PBRI RD&amp;E program will support innovative, high value projects delivered in a timely and cost-effective way. Science quality will be monitored and evaluated through 'lead' RDC procurement and reporting processes.</p>	 <p><b>Responsiveness</b> The PBRI aims to rapidly respond to high priority biosecurity threats by working together to create opportunities to address gaps in research and to provide industry and regional communities with knowledge and tools in a timely manner to prepare for and manage biosecurity threats.</p>	 <p><b>Capability</b> PBRI members will support capability and capacity across science disciplines to deliver high priority plant biosecurity RD&amp;E. Through research investment, the PBRI members provide a mechanism to attract outstanding talent and encourage the mentoring of junior scientists and supervision of graduate students to support future researchers in plant biosecurity.</p>	 <p><b>Financial Effectiveness</b> A series of cross-sectoral RD&amp;E priorities are agreed to and ranked by all PBRI members and revised annually to develop collaborative investments. Where possible, PBRI members and MOU partners inform each other of relevant plant biosecurity research investments (or biosecurity issues to be addressed) to provide opportunities for co-investment. Relevant grant schemes may provide external funds which can also be leveraged by PBRI members, increasing their investment capacity in plant biosecurity RD&amp;E.</p>
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# Alignment to National Strategies

PBRI’s strategic direction and activities are designed to align with national agriculture, biosecurity and innovation strategies through the implementation of components of these strategies (*Table 1*).

The National Farmers’ Federation outlined a roadmap for Australian agriculture to achieve a \$100 billion industry by 2030, of which biosecurity is an important part. The roadmap refers to the critical importance of biosecurity for market access and the role of innovation and cross-sectoral R&D strategies in achieving this goal (*Table 1*).

The Australian Decadal Plan for Agriculture (2017-2026) highlights the importance of biosecurity to agriculture and identifies several areas that will support biosecurity into the future such as genomics, agritech, big data, novel chemistries and coping with climate (*Table 1*).

The Australian, State and Northern Territory Governments, rural R&D corporations, CSIRO, and universities jointly implement the National Primary

Industries RD&E Framework to encourage greater collaboration and promote continuous improvement in the investment of RD&E resources nationally.

Within this framework, the Research and Innovation Committee (R&I) is a sub-committee to the Agriculture Senior Officials Committee (AGSOC). The R&I Committee is responsible for the oversight of stewardship of the Framework.

The R&I Committee looks for improvements in the efficiency and effectiveness of rural RD&E to maximise the contributions of RD&E to primary industries, rural and regional Australia, and the wider community. The Committee provides advice to AGSOC on the overall performance of the primary industries research innovation system and emerging technologies. This includes the National Plant Biosecurity Strategy (2010-2020) and the National Plant Biosecurity RD&E Strategy (2013-2016). The PBRI aligns to and delivers on components of both strategies.

National agriculture and biosecurity strategies	Aligned strategic goals
Decadal Plan for Agriculture (Australian Academy of Science 2017-2026)	<ul style="list-style-type: none"><li>Enhanced biosecurity<ul style="list-style-type: none"><li>» <i>Exploitation of genomics</i>: Rapid diagnostics, Pest and weed control, Gene drives</li><li>» <i>Agritech</i>: Targeted control methods, Remote surveillance</li><li>» <i>Big data analysis</i>: Holistic risk profiles</li><li>» <i>Clever chemistry</i>: Targeted control methods</li></ul></li><li>Coping with climate:<ul style="list-style-type: none"><li>» Invasive threats</li><li>» Changing distributions with climate change</li></ul></li></ul>
National Farmer’s Federation 2030 Road Map - Australian Agriculture’s Plan for a \$100 Billion Industry	<ul style="list-style-type: none"><li>Pillar 1. Customers and the Value Chain:<ul style="list-style-type: none"><li>» 1.3 Australia has world-leading market access, and the capacity to maximise the economic benefits.</li><li>» 1.3.4 Reinforce the importance of domestic biosecurity</li></ul></li><li>Pillar 3. Unlocking Innovation: Public and private R&amp;D efforts work seamlessly to translate world class research into tools and services which give Australian agriculture a competitive edge.<ul style="list-style-type: none"><li>» 3.1.1 Renew and extend existing cross-sectoral R&amp;D strategies to grow the size and impact of both public and private R&amp;D.</li></ul></li></ul>
National Plant Biosecurity Strategy (2010-2020)	<ul style="list-style-type: none"><li>Strategy 8: Develop a national framework for plant biosecurity research</li></ul>
National Plant Biosecurity RD&E Strategy (2013-2016)	<ul style="list-style-type: none"><li>RD&amp;E Strategy 2: Identify and prioritise RD&amp;E areas in plant biosecurity</li></ul>
Priorities for Australia’s Biosecurity System (IGAB 2012) (IGAB review 2017)	<ul style="list-style-type: none"><li>Clear national biosecurity R&amp;I priorities are needed to focus investment, and improved coordination of biosecurity R&amp;I is needed to drive cross-sectoral research, technological developments, and behavioural change</li></ul>
Rural R&D for Profit Program - priority areas (2015-2022)	<ul style="list-style-type: none"><li>Biosecurity priority area: To improve understanding and evidence of pest and disease pathways to help direct biosecurity resources to their best uses, minimising biosecurity threats and improving market access for primary producers.</li></ul>

Table 1. Alignment to national agriculture and biosecurity strategies

National agriculture and biosecurity strategies	Aligned strategic goals
Agricultural Innovation - A National Approach to Grow Australia’s Future (2020)	<ul style="list-style-type: none"><li>Strengthening ecosystem leadership, cohesion, and culture</li><li>Strengthening regions</li><li>Next generation innovation platform</li></ul>
Australia’s Biosecurity Future - Unlocking the next decade (CSIRO 2020-2030)	<ul style="list-style-type: none"><li>System connectivity</li><li>Shared responsibility</li><li>Innovation in science and technology</li></ul>
Department of Agriculture, Water and the Environment - Biosecurity RD&E Strategic Statement 2018-2025	<ul style="list-style-type: none"><li>Establish, promote and review RD&amp;E priorities to guide investment decisions</li><li>Plan and conduct activities and projects collaboratively to maximise return on investment</li><li>Ensure research projects provide scientifically sound evidence to inform policy decisions</li></ul>







# Operating Environment

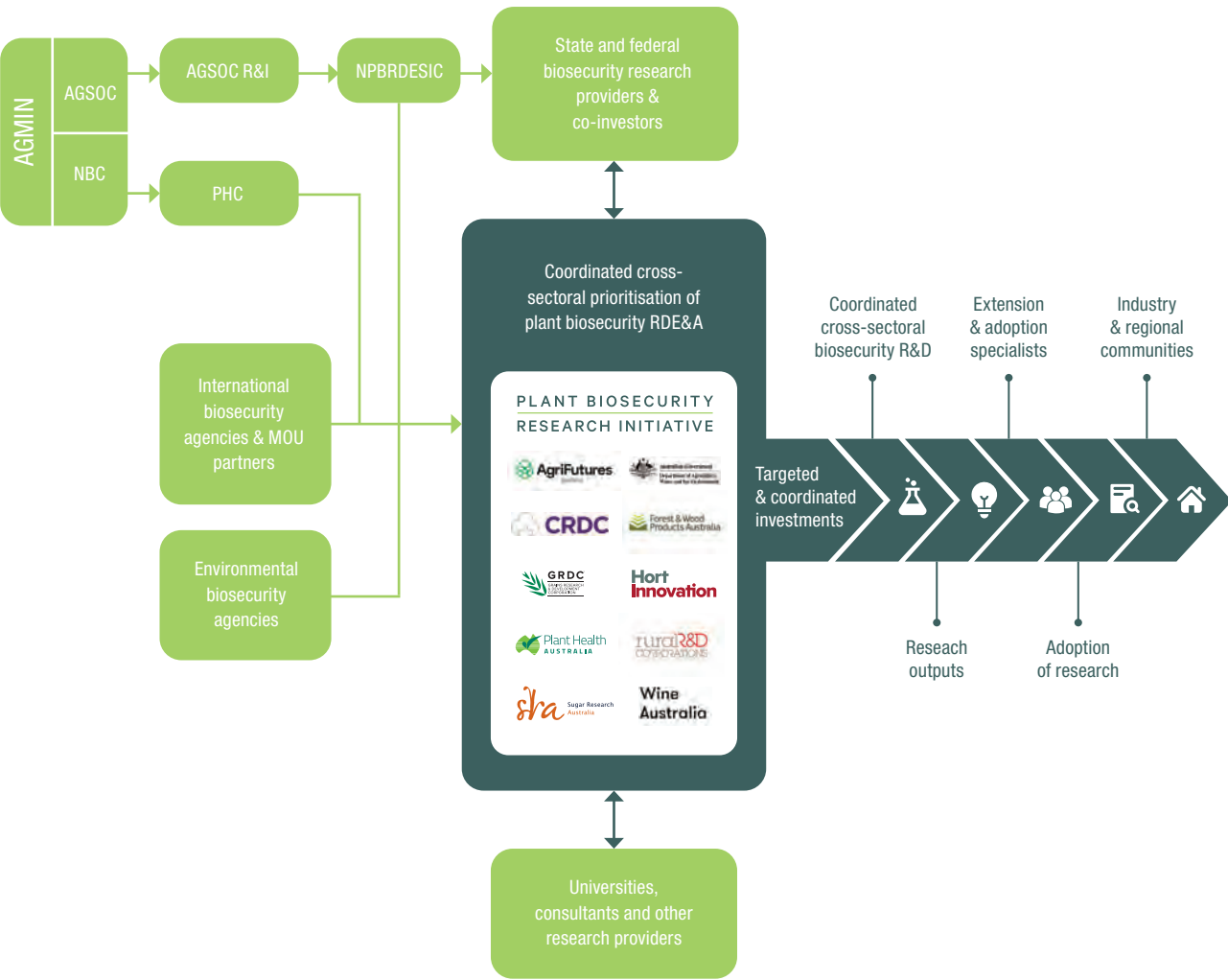
The PBRI operates across the biosecurity landscape. The key to the success of our activities is through collaboration with national and international regulatory, educational, environmental and research and extension operators (Figure 1).

The National Biosecurity Committee (NBC) is a national body that implements IGAB through Plant, Animal and Environmental Health Committees. The Plant Health Committee (PHC) has active sub-committees that assist in this implementation. The

PBRI collaborates and connects with plant health sub-committees to identify research gaps which may be the focus of PBRI co-investment.

Both NBC and AGSOC report to the Agricultural Ministerial Council (AGMIN). AGMIN is the peak forum to collaborate on priority issues of national significance affecting Australia’s primary production sectors including fisheries and forestry.

Figure 1. PBRI’s role in the plant biosecurity operating environment





## Our Scope

Within this operating environment, the PBRI's role is to collaborate, prioritise and co-invest in RD&E that minimises the impact of damaging endemic and exotic pests, diseases and weeds that affect Australia's plant industries, regional communities, and the environment.

### Examples of Cross-Sectoral Plant Pests

#### *Xylella fastidiosa*

*Xylella fastidiosa* is a devastating disease of many species of plants, including crops that we rely on for food and fibre. The bacteria, and related subspecies, kill plants by damaging the water conducting system (xylem) in plants which shows as leaf scorching.

A *Xylella* infection has several names depending on the plant affected. Commonly it is known as bacterial leaf scorch, but in grapes it is known as Pierce's disease, California vine disease and Anaheim disease. In olives it is known as olive quick decline (Figure 2), in peach it is called phony disease, and in citrus is known as variegated chlorosis.

*Xylella* is spreading around the world, causing significant problems as it kills crops and other plants. In recent years, the Puglia region of southern Italy has seen *Xylella* devastate historically and economically important olive trees and orchards.

The disease could arrive in Australia through importation of infected plants or planting material such as budwood, cuttings and rootstock.

Figure 2. Olive decline due to *Xylella fastidiosa* in Italy (Source: University of Berkeley)



#### Brown Marmorated Stink Bug (Halyomorpha halys)

This hitchhiker species stows away in imported goods and can breed to huge populations that become both a household nuisance as well as a major problem for crop growers. It feeds on more than 300 hosts including fruit trees and woody ornamentals.

If established in Australia this pest would be extremely difficult and expensive to manage. It is not easily controlled with pesticides and eats a huge range of plants. It likes to hide in houses in cooler weather and, as the name suggests, also emits an offensive smell.

Figure 3. Brown Marmorated Stink Bug (*Halyomorpha halys*) (Source: AusVeg)



#### Fall Armyworm (Spodoptera frugiperda)

Fall armyworm (*Spodoptera frugiperda*) is a plant pest that can damage a wide variety of crops. The larvae predominantly feed on crops and pastures from the grass (Poaceae) family, in particular maize, but also sorghum, forage grasses, turf grasses, cereals, and rice. The pest can also feed on non-grass crops such as cotton, peanuts, vegetables, and some fruit crops.

Fall armyworm is known for its ability to disperse and migrate long distances, which enables it to exploit new habitats and expand its range.

Figure 4. Fall armyworm (*Spodoptera frugiperda*) (Source: AgriOrbit)



It is a moth native to the American tropics which has become a pest worldwide. Fall armyworm was first recorded in Australia in January 2020 on two Torres Strait islands, followed by discoveries in Queensland (February 2020), the Northern Territory (March 2020), Western Australia in Kununurra, the Kimberley region and Broome (March 2020), and by November 2020 it had been reported in western NSW.



# Stakeholders and Investors

## PBRI Members

To underpin successful plant biosecurity RD&E that has impact, the PBRI aims to deliver efficiencies for member organisations through leveraging research investments across sectors. This creates enduring and larger impact for plant industries with greater cost efficiencies, compared to developing multiple single-industry projects.

These investments focus on cross-sectoral pests or platform technologies which can be applied across industries, such as machine learning or next generation sequencing.

Coordination and collaboration are important to achieve these efficiencies. The ability to share knowledge and resources, targeting plant biosecurity research, is invaluable.

The PBRI collaboration supports RDCs to form closer and productive ties with the Australian Government and Plant Health Australia, enabling more effective national coordination of RD&E.

## Plant industries, peak industry bodies and growers

PBRI provides similar benefit to industry by leveraging the grower levies paid through member organisations.

The PBRI co-investments will ideally also leverage external grant funds, such as the Rural R&D for Profit Scheme. This pooling of resources enables larger research projects, with greater impact, targeted at better preparedness and resilience for industry.

The coordinated research investments made by the PBRI members will be more efficient in supporting projects that aim to minimise the negative consequences of high priority biosecurity threats.

## Regional Communities

Research with 'across-industry' outcomes in biosecurity has a higher chance of being adopted on a regional basis, since Australian farming regions are home to a variety of plant industries.

Where relevant, cross-sectoral biosecurity projects will be developed with outcomes for regions and their communities focussed on capacity to respond to biosecurity threats.

The PBRI will invest in projects that provide better biosecurity outcomes for the regional communities that support plant industries.

## Australian Government

The PBRI strategy and investment priorities are agreed on across plant industry sectors and deliver on Australian Government priorities, set by the National Biosecurity Committee, the Plant Health Committee, and its sub-committees. On a project-by-project basis, the PBRI may invest in projects that deliver on national action plans from the Department of Agriculture, Water and the Environment, such as those for Xylella and the Brown Marmorated Stink Bug.

## National Extension Networks

Project outcomes and outputs will be distributed through the PBRI member extensions networks to maximise the uptake and adoption of PBRI coordinated RD&E. Conversely, any cross-sectoral RD&E priorities from growers will also be contributed by extension networks back to the PBRI members for consideration.

## State Biosecurity Agencies

To avoid duplication between industry and state-based RD&E programs, the PBRI priorities and investments will be shared with state government agencies. This will contribute to better national coordination of plant biosecurity RD&E and make sure any duplication of research is avoided.

The PBRI will provide a crucial focal point for collaborative plant industry-state government partnerships for improved biosecurity outcomes. Opportunities for state government agencies to further leverage investment made by the PBRI members will occur through large-scale national plant biosecurity projects.

## Researchers

Biosecurity that is built on robust science is crucial. PBRI member investments support high-quality science that underpins and contributes to building capability for researchers in fields relating to the six key focus areas of the PBRI.

Co-investment in research may be used to support post-doctoral fellows and students in developing the future scientific capability, skills and knowledge for research organisations that will be essential for plant biosecurity in Australia.

## External Co-Investors

The PBRI represents a consolidation of parties committed to investing in plant biosecurity RD&E. This collective co-investing power provides significant leveraging capacity that can be attractive to external investors.

The PBRI's unique role within the plant biosecurity landscape has established a key set of nationally important focus areas and investment priorities that are visible to such investors.



Jasmin Koric with her partner Jay and his brothers Brad and Travis Collins during harvest at their Morawa, WA farm. Photo: GRDC/Nicole Baxter.



# Governance

There are ten partners on the PBRI collaborative agreement, including the seven plant RDCs, Plant Health Australia, the Australian Government Department of Agriculture, Water and the Environment, and the Council of Rural RDCs.

A PBRI Management Committee was established which includes a General Manager or equivalent representative from each organisation, and a Program Director.

## Member Agreement

- The ten PBRI members agree to:
- Contribute to the development and implementation of the PBRI Strategy with a view to playing a **long-term role in developing RD&E** across plant industries.
  - Meet each quarter to share relevant information from their sector on plant biosecurity, discuss strategic issues and to **prioritise cross-sectoral plant biosecurity RD&E for co-investment**.
  - **Support a nationally coordinated, science-based system** that protects the plant biosecurity of all Australia's plant industries and coordination of funding for RD&E.
  - **Collaborate across plant sectors and government** to meet PBRI objectives.
  - Appoint a **Chair and Deputy Chair and Program Director** on a quarterly rotating basis for the term of the agreement.
  - **Manage conflicts of interest and confidentiality** through the terms of the agreement.



## Investment

- Investment is strategic and considered to ensure maximum impact for industry:
- The PBRI does not represent a new investment entity with legal and financial structures or administrative overheads. Instead, PBRI harnesses the significant collective investment power of the plant industry RDCs.
  - The resources available to the PBRI for investment in RD&E arise from levies paid by plant industry growers and contributions made by the Australian Government.
  - In 2018-2019, the total RD&E investment made by the seven member RDCs was \$415 million, which included approximately \$135 million spent on plant biosecurity research.
  - Cross-sectoral research contracting is managed by a nominated lead RDC, with co-investment made by other interested RDCs providing additional cash on a project-by-project basis. The management of these research investments is the responsibility of the respective RDCs.
  - Applications to grants schemes relevant to plant biosecurity will be used to leverage the collective investments made by PBRI members. Collaboration with external partners will provide further opportunities to leverage investments.

# Our Drivers

Table 2. Challenges and opportunities driving our collaboration and co-investment in plant biosecurity RD&E.

Climate change	<ul style="list-style-type: none"><li>• Small increases in temperature and atmospheric CO2 will influence the biology and distribution of insect and pathogens of plants and may increase the susceptibility of some plant species to pests.</li></ul>
Economic	<ul style="list-style-type: none"><li>• An incursion of a biosecurity threat will cause economic impact through losses to production and markets.</li><li>• Public sector investment into RD&amp;E is likely to decline.</li></ul>
Future capacity	<ul style="list-style-type: none"><li>• Developing expertise in plant biosecurity is critical to be able to respond to biosecurity threats into the future.</li></ul>
Political	<ul style="list-style-type: none"><li>• Pest detections will continue to be a non-tariff barrier to trade.</li><li>• Market access constraints and increased costs due to increasingly prescriptive pest management strategies.</li><li>• Australia's market access negotiations will require stronger evidence to demonstrate our pest and disease freedom.</li></ul>
Social	<ul style="list-style-type: none"><li>• A biosecurity incursion will have negative social impacts to growers and their families, to their employees, staff employed along the supply chain, and to the broader regional community.</li></ul>
Technology	<ul style="list-style-type: none"><li>• Digital data will continue to influence plant biosecurity operations and will require ongoing curation and management e.g., whole genome sequences, surveillance datapoints.</li><li>• Artificial intelligence, Internet of Things (IoT) and digital innovations will continue to influence areas such as diagnostics and surveillance.</li></ul>
Trade and passenger movement	<ul style="list-style-type: none"><li>• By 2030, international and domestic passenger movements through Australian capital cities is expected to double compared to 2016.</li><li>• The volume of freight flown into and out of Australia is projected to increase by 120% from 2014 to 2030, presenting greater opportunity for pest and disease introduction.</li></ul>





## Strategic Goals

The PBRI's three strategic goals are aligned to member organisation goals and the broader national agriculture, innovation and biosecurity frameworks:

**Goal 1:**  
**Identification of targeted cross-sectoral plant biosecurity innovation for co-investment.**

**Goal 2:**  
**Responsive coordination and leveraging high value cross-sectoral investment in plant biosecurity innovation.**

**Goal 3:**  
**Promotion and facilitation of collaboration for better plant biosecurity outcomes for industry, their communities, and the environment.**



## Strategic Goal 1

# Identification of targeted cross-sectoral plant biosecurity innovation for co-investment

### How we achieve this goal

To address potential inefficiencies in multiple, single industry biosecurity RD&E investments there is a need to identify cross-sectoral targets for investment and prioritise them according to member's strategic needs. There are several ways in which PBRI facilitates this:

- Cross-sectoral plant biosecurity RD&E ideas are submitted to PBRI by member organisations through a workshop process structured around the six Key Focus Areas. These ideas are then ranked by all members for the development of an investment plan which is agreed to by all members.
- The ideas are drawn from biosecurity issues that require RD&E to address a problem and are developed through the member organisation's processes such as grower, advisory and technical panels.
- Gap analyses on plant biosecurity issues are commissioned by members to identify the highest priority areas that need addressing with RD&E.
- Pest and disease issues and platform technologies, common to more than one member, are discussed and prioritised by PBRI members at quarterly PBRI meetings.
- National priorities included in the Department of Agriculture, Water and the Environment National Action plans are also considered as part of this process.
- RD&E ideas from the research community are elicited through the biannual PBRI Symposium Poll.

- The PBRI considers its MOU partner's research priorities when ranking RD&E ideas. For example, B3 New Zealand have common plant pest threats such as *Xylella* and BMSB, therefore it is of mutual benefit to consider co-investing in research ideas together that addresses these threats.

### Performance measures

- Opportunities for cross-sectoral investment in plant biosecurity innovation are identified.
- High impact investment ideas are agreed to and prioritised across sectors.

**"It is clear that PBRI has played the role of a brokering/clearing house for biosecurity RD&E issues. This has enabled the PBRI to respond to opportunities and over time gain leverage from these investments."**

**Independent review of PBRI (RM Consulting Group, 2020)**



Photo: Department of Agriculture, Water and the Environment.



## Strategic Goal 2

# Responsive coordination and leveraging high value cross-sectoral investment in plant biosecurity innovation

### How we achieve this goal

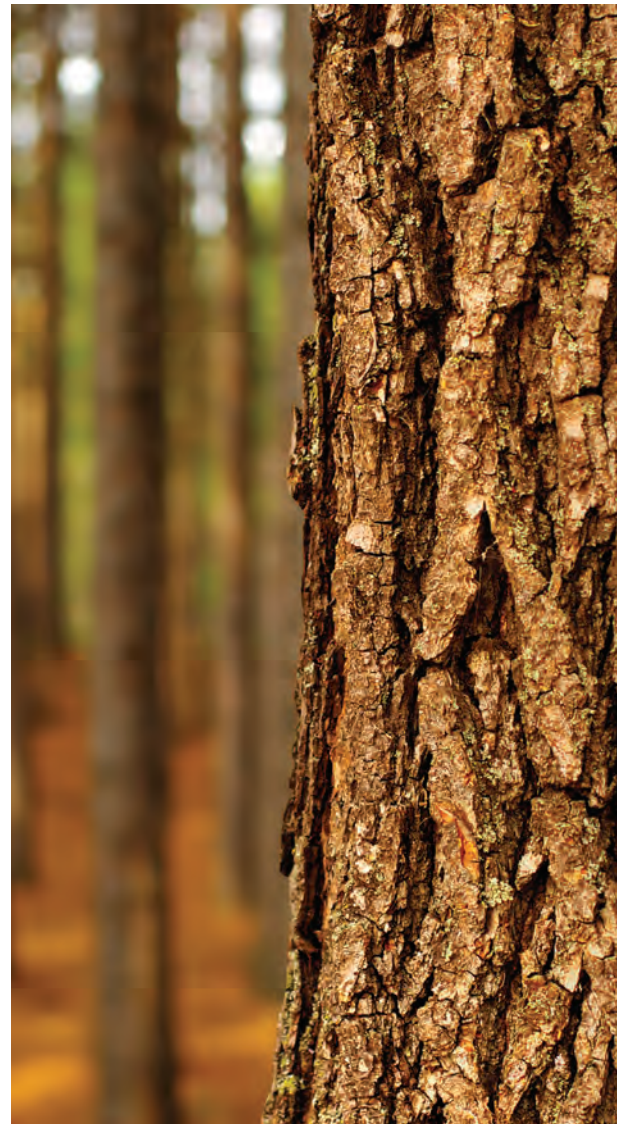
The PBRI members have agreed to six key focus areas to coordinate and target their investments as a collective in a responsive manner.

### Performance measures

- Plant biosecurity investment ideas are coordinated and targeted to avoid duplication of RD&E across plant sectors.
- Co-investment is made in high impact plant biosecurity RD&E in the six key focus areas.
- New funding opportunities leverage member investment.

**“The PBRI has steered towards focusing on projects of national significance. This trend is supported and the PBRI should continue to focus on larger and more complex projects that can make a real difference to plant biosecurity.”**

**Independent review of PBRI  
(RM Consulting Group, 2020)**



### Key focus areas



#### 1. Preparedness: Industry is better prepared for the arrival of a biosecurity threat

Improved plant biosecurity preparedness requires an understanding of pest introduction pathways, and the relative risks associated with these pathways. These risk assessments will require intelligence gathered offshore for emerging global pests and the potential for their introduction and establishment in Australia.

Examples of cross-sectoral investments:

- Intelligence on global pest threats that pose a risk to Australian plant industries and the environment
- Increase awareness and contingency planning for key biosecurity threats
- Regional preparedness plans for threats with cross-industry impact.
- Quantifying the economic impact of key pests to inform RD&E investment and response.
- Assess and respond to changing threat status to biology and distribution with climate change
- Deliver cross-sectoral simulation exercises and scenario planning for incursions of High Priority Plant Pests



#### 2. Diagnostics: Rapid, accurate and cost-effective detection of high priority pests and diseases

Early and accurate diagnosis enables a rapid response to threats that impact on production and access to domestic and international markets.

The speed of diagnosis can greatly increase the chance of containment of an incursion and subsequent eradication and provide the evidence to prove property or regional freedom for trade and market access.

The PBRI will continue to support the development of new platforms and technologies that rapidly identify and differentiate biosecurity threats at the border, in-field and along commodity supply chains.

Examples of cross-sectoral investments:

- Develop new technologies and platforms to support early detection, surveillance, and timely response, for example, next gen sequencing, eDNA, high throughput for viruses, artificial intelligence, remote sensing, and technologies specifically targeting clean shipping containers and other supply chains.
- Develop rapid detection tools for cross-sectoral pests, pathogens, and weeds, for example, lamp, dip-stick, field tests, apps, smart traps.
- Timely development and validation of National Diagnostic Protocols



## Strategic Goal 2



### 3. Surveillance: Cost-effective and coordinated surveillance activities to support markets and the environment

Cost-efficient and coordinated surveillance is vital for the early detection of exotic or serious endemic pests throughout Australia.

Surveillance includes collection, collation, analysis, interpretation, and timely dissemination of information on plant pests and the hosts that they affect. Monitoring and surveillance enables Australia to direct its response to incursions or manage the further spread of plant pests.

Significant trade and environmental decisions are based on the information supplied by national surveillance programs conducted by industry and state governments.

Examples of cross-sectoral investments:

- Build and extend the Honeybee surveillance program for pests such as Varroa
- Improved surveillance tools for soil and water-borne pest and disease monitoring and surveillance
- Insecticide resistance monitoring across plant industry sectors
- Targeted and coordinated surveillance
- within Australia and with near neighbours (PNG, Indonesia)
- Support and respond to the strategic review of digital and data systems in plant biosecurity to support market access and a coordinated response.



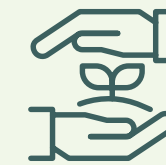
### 4. Pest Management: Management of pests, weeds, and diseases with minimal impact to the environment and trade

Managing pests on crops such as grain, pulses, cereals, rice and horticultural crops requires control options that comply with domestic and international guidelines. For crops such as sugarcane, cotton and wood, there is a focus on managing pests in natural environments and the need to comply with environmental guidelines.

For all crops there is also a requirement to avoid control options that disturb the natural balance of beneficial organisms in the farm environment.

Examples of cross-sectoral investments:

- Coordination of permits across-industry for chemical use during incursions of HPPPs
- Developing sustainable chemical control for pests and weeds
- Responding to pasture pests and pesticide resistance
- Technologies and methodologies for supporting business resilience
- Novel options for pest and weed control



### 5. Capacity Building: Future capability for plant biosecurity through training and development

The PBRI aims to support gaps in Australian biosecurity capacity by investing in the training of scientists and industry personnel through investments aligned to the six key focus areas. This may be through specific research or extension projects or scientific placements offshore. Alternatively, it may include bringing experts from overseas to speak to industry and scientists on cross-sectoral biosecurity issues.

Through a partnership with ACIAR, we will share biosecurity expertise to build capacity with neighbouring countries to manage high priority threats while improving Australian scientist and extension staff's expertise before the pest reaches our shores.

The PBRI program of research will include opportunities for research agencies to employ post-graduate students or train students to contribute to future capacity in plant biosecurity.

Examples of cross-sectoral investments:

- Scientific conferences, targeted workshops, and biosecurity networking across-industry
- Programs targeting Indigenous engagement and biosecurity capacity building
- Addressing gaps in capacity through post-graduate training
- Training and extension with consultants, particularly northern production systems
- Extension practitioners' biosecurity community of practice across industry sectors
- Offshore training and capacity building in countries where high priority pests are present.



### 6. Industry Resilience: Greater participation of industry in biosecurity decision-making to reduce economic and social consequences

In Australia, plant industries experience a multitude of challenges to their business operations and overall industry resilience. Never has this been more apparent than in 2020, when the global pandemic COVID-19 arrived in Australia, seriously affecting labour, supply chains and domestic and international markets.

Biosecurity threats are yet another challenge to industry resilience with several recent experiences in Australia that have resulted in significant economic and social costs to growers and their communities.

Close partnerships between industry and government are essential in responding to biosecurity threats. The role of agronomists and extension networks will be central to achieving this.

Examples of cross-sectoral investments:

- Social and economic research – barriers and incentives to adoption of good biosecurity practices
- Industry business intelligence integrated into contingency plans
- Continued importance on extension networks as first detectors and in preparedness and response
- Regional community approach to biosecurity RD&E e.g., cross-sectoral response plans, regional pesticide resistance management
- Addressing gaps in contingency plans for cross-sectoral pests



## Strategic Goal 3

# Promotion and facilitation of collaboration for better plant biosecurity outcomes for industry, their communities, and the environment

### How we achieve this goal

The PBRI is a collaboration of ten organisations with an interest in creating impact across sectors in Australian plant biosecurity. The members agree that greater national impact for biosecurity can be achieved by working together as a collective, rather than as individual organisations.

Collaboration is more than a measure of total co-investment or the number of industries represented, it is about sharing knowledge and leveraging thinking and decision-making, which can lead to more sustained impact through the development of plant biosecurity projects together.

Collaboration is critical in achieving the PBRI Strategic Goals 1 and 2, where the members work together to prioritise cross-sectoral ideas for investment, which leads to co-investment and leveraging of resources for mutually beneficial projects.

The PBRI members also recognise the benefit of working with the states and territories on addressing gaps in RD&E to improve our preparedness and response to biosecurity threats, such as the rapid spread and damage caused by the arrival of the Fall armyworm.

Equally there is enormous benefit in working with our overseas partners such as B3 in New Zealand, Euphresco in Europe, and ACIAR and its partner countries in Asia, the Pacific and Africa.

### Collaboration Agreement

The independent review of PBRI recognised a high-level of collaboration has been achieved, particularly between member RDCs, Plant Health Australia and the Australian Government through the Department of Agriculture, Water and the Environment.

This collaboration is supported by having an agreement in place which outlines the aims, principles, and governance of PBRI. This was developed and signed by all members. Collaboration between members is also underpinned by the PBRI Strategy which sets an agreed direction for collaborative projects over a five-year timeframe.

The PBRI holds quarterly committee meetings at member offices around the country or via video, with structured agendas focussed on delivering the strategic goals.

**“A natural evolution and maturity of the collaboration has occurred during Phase 1, with an expectation of building on this foundation and increasing its impact in the national plant biosecurity RD&E arena in the next phase of the PBRI.”**

**Independent review of PBRI  
(RM Consulting Group, 2020)**

### Collaboration with state jurisdictions

Collaboration between the state jurisdictions and PBRI has been advanced by national projects contracted through PBRI, such as the national diagnostics capability building project and iMapPESTS. The states and territory and plant RDCs were included as cash or in-kind contributors on these projects.

The independent review recommended further collaboration with the states should be considered through similar large-scale national plant biosecurity projects and ideally through more strategic engagement.

### Contribution to national plant biosecurity strategies

PBRI committee members contribute an expert advisory role to national plant biosecurity strategies such as: National Surveillance Strategy, National Diagnostic Strategy and the National Plant Biosecurity RD&E Strategy.

### International Partnerships

**Better Border Biosecurity (B3) New Zealand**  
In August 2018, an MOU was signed with B3 New Zealand outlining the intention to collaborate on biosecurity R&D with the PBRI. The B3 unincorporated joint venture integrates investment and expertise from five science agencies – Plant & Food Research, AgResearch, Scion, Landcare Research, the Bio-Protection Research Centre at Lincoln University - and three New Zealand end-user partners - the Ministry for Primary Industries, the Department of Conservation and the New Zealand Forest Owners Association.

The MOU between PBRI and B3 underpins a collaboration to focus on preventing shared biosecurity threats with greater efficiency around investments between the two countries.

### European Phytosanitary Research Coordination (Euphresco)

In March 2020, the PBRI also signed an MOU with an international counterpart, Euphresco, to share topics of research investment that would identify areas for collaboration. The purpose is to make sure Australia is not duplicating research already underway in Europe

(where appropriate) and linkages are made on projects focussed on biosecurity threats of mutual concern, such as Xylella.

### Australian Centre for International Agriculture Research (ACIAR)

In October 2020, the PBRI signed an MOU with ACIAR, an agency that supports research projects in four regions - eastern and southern Africa, East Asia, South and West Asia and the Pacific. Their research projects focus on crops, agribusiness, horticulture, forestry, livestock, fisheries, water and climate, social sciences, and soil and land management.

ACIAR invests in and manage strategic partnerships with public and private research institutions to improve the productivity and sustainability of agricultural systems and the resilience of food systems in partner countries.

Through this MOU, strategic projects will be identified in biosecurity capacity building for co-investment.

### Performance measures

- PBRI collaboration continues to be of value to its members
- Collaboration on contracted projects are reported as beneficial in achieving biosecurity outcomes
- International and national partnerships are valuable to plant biosecurity R&D
- Increased engagement with state jurisdictions
- Successful Plant Biosecurity Symposium
- Cross-sectoral projects are visible and used by extension and adoption teams



## Acknowledgements

We acknowledge past and present PBRI Committee Members, and their staff, for input into this Strategy. We also acknowledge the plant biosecurity research community, the state jurisdictions and the broader plant biosecurity community that have helped shape this document.

## Disclaimer

PBRI has taken all reasonable care to ensure that the information contained within this strategy is accurate at the time of publishing (December 2020). The members of PBRI accept no responsibility for any errors contained within this document or for any loss or damage suffered by users or any of the information and material contained herewith.