



Plant Biosecurity Research Initiative

Strategy 2023-2028

PLANT BIOSECURITY
RESEARCH INITIATIVE



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Strategy on a Page



PBRI Purpose

Research collaboration for better plant biosecurity outcomes.



PBRI Vision

PBRI is a leader in collaboration, delivering innovative and impactful biosecurity research.



PBRI Scope

Research, development and extension that minimises the impact of damaging endemic and exotic pests, diseases and weeds that affect Australia's plant industries, communities and the environment.

How we work together

- **Proactive:** We proactively address biosecurity threats together, designing RD&E that creates impact across industries.
- **Collaborative:** We collaborate on innovative RD&E to create biosecurity outcomes that have shared benefit.
- **Responsible:** The PBRI members have a strong commitment to sharing biosecurity knowledge and playing their role in the biosecurity system.
- **Efficient:** We pursue investment efficiencies in biosecurity RD&E and continuous improvement in how we operate together.
- **Collective leadership:** Together we lead a unique platform for co-investing across the plant biosecurity ecosystem with expertise from multiple plant production industries.
- **Accountability:** We operate with strong governance and accountability to create a sustainable platform for collaboration and co-investment.

Strategic Goals

Goal 1: Identify and explore novel approaches and technologies for biosecurity.

Goal 2: Coordinate and leverage high value cross-sectoral investment in plant biosecurity innovation.

Goal 3: Drive responsive collaboration for better plant biosecurity outcomes.

Key Focus Areas

Key Focus Area 1: Early warning and risk

Key Focus Area 2: Diagnostics and surveillance

Key Focus Area 3: Resilient crop protection systems

Key Focus Area 4: Readiness and recovery

PBRI members

- Australian Government Department of Agriculture, Fisheries and Forestry (DAFF)
- AgriFutures Australia
- Cotton Research and Development Corporation (CRDC)
- Forest and Wood Products Australia Limited (FWPA)
- Grains Research and Development Corporation (GRDC)
- Horticulture Innovation Australia Limited
- Sugar Research Australia (SRA) Limited
- Wine Australia



Background

Plant industries are vital to Australia's economy, contributing more than \$43.8 billion in 2021-2022. These industries, which include field crops, trees, horticulture and viticulture, are the foundation of Australian regions.

In the ever-evolving global landscape, safeguarding plant health is vital for ensuring global food security, sustainable communities and healthy ecosystems. Minimising the loss of production and markets caused by biosecurity threats such as insects, pathogens and weeds is therefore a key focus for plant industries.

In Australia, plant biosecurity is underpinned by science and innovation, which is supported by industry, and public and private investment in partnership with

Research and Development Corporations (RDCs), the states and territories and the Australian Government Department of Agriculture, Fisheries and Forestry. Australian science agencies also invest in plant biosecurity research through in-kind capability and cash resources.

Recognising the critical need for aligned efforts in the plant biosecurity space, the Plant Biosecurity Research Initiative (PBRI) model was established. The PBRI provides a platform for organisations to create and invest in plant biosecurity research, development and extension (RD&E) activities. By pooling resources and expertise, the PBRI achieves a level of efficiency and impact that transcends individual capabilities.



About us

The PBRI is a collaboration between Australia's seven plant RDCs and the Department of Agriculture, Fisheries and Forestry. Its specific focus is coordinating plant biosecurity research.

The PBRI was formed in 2017 in response to the Intergovernmental Agreement on Biosecurity (IGAB) Review (Craik et al, 2017) which highlighted the lack of coordination of biosecurity research and innovation, particularly in cross-sectoral biosecurity research. At that time, the Australian biosecurity research landscape was defined as fragmented with replicated investments in biosecurity research across industries.

Across PBRI Phase I, a total of 12 investments valued at \$51M were initiated and in Phase II, a total of 10 investments valued at \$17.4M were prioritised and commissioned for delivery through the membership base.

In a demonstration of the continued need for coordination of RD&E, in 2023, the PBRI Collaboration Agreement was renewed for another five years (2023-2028), further consolidating the PBRI's position as a leader in biosecurity collaboration.

A comprehensive independent review of PBRI Phase II was delivered by Ag Econ in April 2023. This review found that from 2020 to 2023, the PBRI delivered its strategic goals of prioritising and coordinating collaborative plant biosecurity RD&E.

The review found the PBRI's success was underpinned by the lean and agile membership base, combined with the coordination efforts of the Program Director, which supported a culture of collaborative intent.

At the end of Phase II, the PBRI was recognised as a:

- Cost-efficient and sustainable model for co-investment in biosecurity innovation across plant industries.
- Focal point of plant biosecurity RD&E expertise relevant to plant industries.
- Facilitator of biosecurity collaboration and networks, linking researchers, industry and government.



The Future

The new five-year agreement signifies the ongoing support by members for the PBRI collaboration model and its role in the Australian biosecurity landscape. It is also an acknowledgement of the benefits and efficiencies delivered through the coordination of biosecurity RD&E priorities and investment across Australian plant industries.

The PBRI will continue to bring together plant industry bodies and growers, regional communities, the Australian Government, extension networks, plant biosecurity committees, state governments and research providers to set RD&E priorities and to co-invest in biosecurity research across plant industries.

The PBRI members value the MOU partnerships developed over the six years with B3 New Zealand, Euphresco, ACIAR, the Plant Health Committee and Plant Health Australia. Each partnership mirrors the concept of minimising duplication of investments by sharing knowledge, mutual biosecurity challenges and opportunities for biosecurity RD&E.

PBRI at a glance



\$69.4 Million

\$69.4 million has been co-invested by PBRI members and partners in plant biosecurity RD&E since the PBRI was established in 2017.



\$43.8 Billion

The collective value of production of plant industries supported by the PBRI is approximately \$43.8 billion (2021-2022).



257 Plant Health Student members

There are 257 global members of the PBRI Plant Health Student Network.



Protection from \$4.7 Billion losses

Introduced pests cost Australia \$4.7 billion in agricultural production losses annually.



560 Attendees

560 people attended PBRI online forums including the Biosecurity Extension Community workshops and RD&E priority workshops.



The Risks



2.6 million shipping containers arrived in Australia (2020-21).



More than 2,600 detections made post biosecurity control (2020-21).



1.6 million jobs across the agricultural supply chain.



\$5.2 billion potential cost to our producers and consumers of pollination-dependent crops over 30 years in the event of a varroa mite incursion (2022 estimate).



More than 380 native species of plants have proved capable of being infected by myrtle rust, with this number likely to grow (2020 estimate).



\$7.8-\$11.1 billion potential cost to Australian horticultural industries over 50 years in present value terms if a worst-case *Xylella fastidiosa* incursion occurred (2021 estimate).

Australian Government National Biosecurity Strategy 2022-2032.



Our members

The PBRI is a partnership between Australia's seven plant RDCs and the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF).

The seven plant RDCs are:

- AgriFutures Australia
- Cotton Research and Development Corporation (CRDC)
- Forest and Wood Products Australia Limited (FWPA)
- Grains Research and Development Corporation (GRDC)
- Horticulture Innovation Australia Limited
- Sugar Research Australia (SRA) Limited
- Wine Australia

Ownership of the PBRI Strategy resides with the PBRI Management Committee which includes a representative member from each organisation.

The PBRI Management Committee membership includes General Managers or the equivalent of each RDC, the Australian Chief Plant Health Officer (DAFF) and the Program Director of the PBRI.

All eight parties were signatories to the PBRI (Phase III) Collaboration Agreement, effective from July 2023 to June 2028.



How we work together



Proactive

We proactively address biosecurity threats together, designing RD&E that creates impact across industries.

When Fall armyworm arrived in Australia, we rapidly responded with a series of expert podcasts to create maximum awareness of this new pest. A Fall armyworm business continuity plan was deployed and management strategies were developed.



Collaborative

We collaborate on innovative RD&E to create biosecurity outcomes that have shared benefit.

All PBRI members, states and territories co-invested in a surveillance project called [iMapPESTS](#) (worth \$21.7 million) which was supported by the Commonwealth Rural R&D for Profit program. This project developed tools to monitor airborne pests and diseases for on-farm pest management.



Responsible

The PBRI members have a strong commitment to sharing biosecurity knowledge and playing their role in the biosecurity system.

Members actively contribute to national biosecurity strategy and white papers, strategy implementation plans, technical and advisory roles, and Plant Health Committees and sub committees.





Efficient

We pursue investment efficiencies in biosecurity RD&E and continuous improvement in how we operate together.

We have led co-investment with research providers and states and territories in projects such as Boosting Diagnostics (\$15.9 million). Greater impact was achieved by co-investing in this research than could be realised as a single RDC investment.



Collective Leadership

Together we lead a unique platform for co-investing across the plant biosecurity ecosystem with expertise from multiple plant production industries.

There is no equivalent initiative for coordinating plant biosecurity RD&E priorities and co-investment in Australia.



Accountable

We operate with strong governance and accountability to create a sustainable platform for collaboration and co-investment.

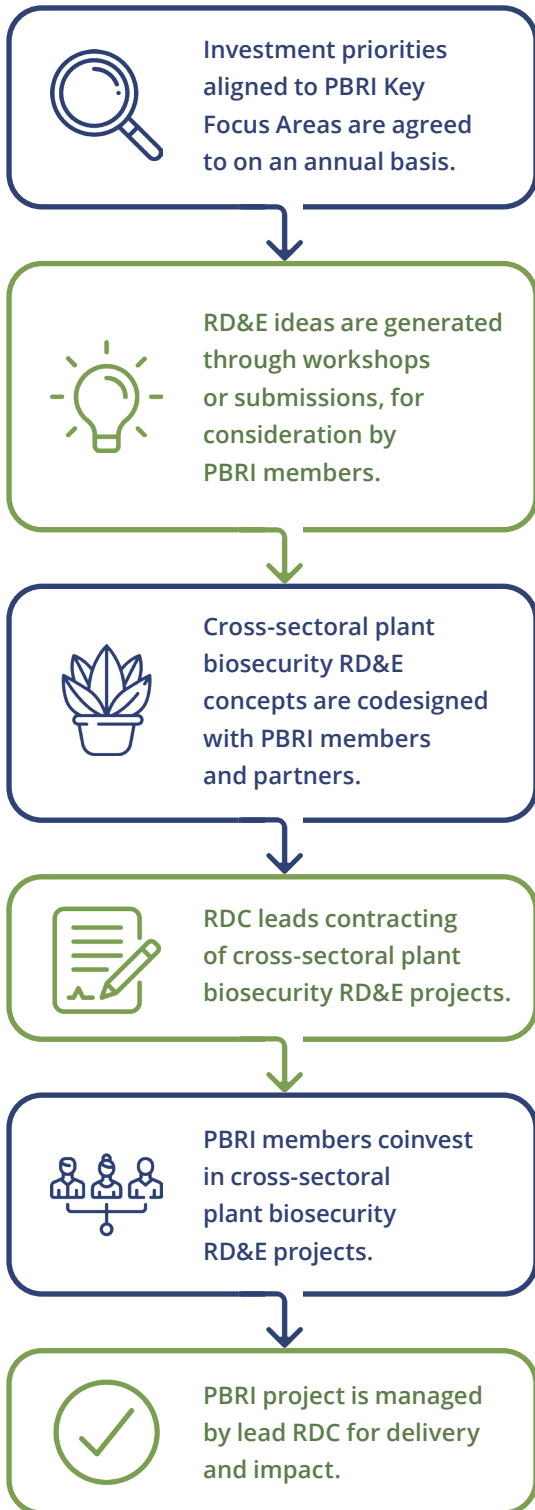
A five-year agreement has been signed between members with clear expectations and responsibilities outlined. A management committee is installed that meets each quarter with a rotating member chair. A monitoring and evaluation framework is agreed to which sets out KPIs for the PBRI which are monitored and analysed at regular intervals and more formally through a periodic independent review.



PBRI co-investment model

The PBRI's Co-Investment Model was developed in Phase II.

The model ensures projects are aligned to PBRI's Key Focus Areas, that RD&E ideas are generated from a wide pool of sources, including workshops, research pitches and concept submissions, and that RD&E concepts are co-designed with industry and partners.



This Strategy



Purpose:

Research collaboration for better plant biosecurity outcomes.



Vision:

PBRI is nationally recognised as a leading example of collaboration, delivering innovative research for biosecurity with impact.



Scope:

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

This PBRI Strategy provides a framework for priority areas of collaboration and co-investment activities over five years. It describes the PBRI's Purpose, Vision, Scope, Strategic Goals and Key Focus Areas, to set the direction for plant biosecurity RD&E.

Guided by this strategy, and in concert 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 strategy builds on six years of successful collaboration focussed on minimising duplication in plant biosecurity RD&E investment and resets our direction.

Annual investment priorities will be developed by the PBRI members, using the four Key Focus Areas in this strategy as priority themes. Co-design workshops, research calls and tenders will be used to develop RD&E ideas for contracted collaborative projects.

A monitoring and evaluation framework has been developed to measure the success of this third phase of PBRI. The framework includes KPIs linked to the three strategic goals, with an emphasis on communicating the impact of the PBRI activities and co-investments over the five years.

This was a recommendation from the independent review undertaken by AgEcon who assessed the progress of the PBRI against the 2020-2023 strategy (April 2023).

Strategic Goal 1

Identify and explore novel approaches and technologies for biosecurity

How we achieve this goal

- Cross-sectoral plant biosecurity RD&E ideas are submitted to PBRI by member organisations through a workshop process structured around four Key Focus Areas. These ideas are used in investment planning which is agreed to by all members.
- 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, Fisheries and Forestry plans are considered as part of this process.
- RD&E ideas from the research community are drawn from workshops and symposia.
- The PBRI considers its MOU partner's research priorities when ranking RD&E ideas. For example, B3 New Zealand and Euphresco 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 address 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.

Independent Review

“Informed by evidence from all stakeholders, the review found that the PBRI Phase II delivery achieved the intended outcome of prioritising and delivering collaborative plant biosecurity RD&E. The lean and agile membership base.....supported a culture of collaborative intent which has been crucial to the success of the PBRI” — AgEcon 2023

Strategic Goal 2

Coordinate and leverage high value cross-sectoral investment in plant biosecurity innovation

How we achieve this goal

- The PBRI focuses on providing a platform for supporting cross-sectoral co-investment in plant biosecurity RD&E priorities, driven by collaborations and partnerships.
- The four Key Focus Areas outlined in this strategy and our annual investment priorities provide a framework to make decisions about where the PBRI will co-invest.
- Ideas are coordinated and codesigned by interested PBRI members and partners. PBRI concepts must have cross-industry benefit, addressing key biosecurity issues. The concepts are developed and contracted by a single member organisation.
- The project investments are made through financial contributions from PBRI members, partner organisations and research providers.

Performance measures

- Cross-sectoral biosecurity RD&E investments are made for the benefit of Australian plant industries.
- PBRI codesigns biosecurity investments with the users and beneficiaries of RD&E.

Independent Review

“Across Phase II of PBRI, a total of 10 investments to the value of \$17.4M were prioritised and commissioned for delivery through the membership base, in addition to the 12 investments worth \$51.0M initiated in Phase I aligning across six Key Focus Areas defined through the PBRI Strategy 2018-2023”
— *AgEcon, 2023*

Strategic Goal 3

Drive responsive collaboration for better plant biosecurity outcomes

How we achieve this goal

- Greater national impact for biosecurity can be achieved by working together as a collective, rather than as individual organisations.
- The PBRI is a collaboration of eight organisations with an interest in creating impact in biosecurity RD&E across Australian plant sectors. This collaboration is formalised by an agreement which outlines the aims, principles, and governance of PBRI. The PBRI holds quarterly committee meetings with an agenda that focusses on delivering the strategic goals.
- Collaboration is critical in achieving our Strategic Goals 1 and 2, which require members to work together to prioritise cross-sectoral ideas for investment, leading to the leveraging of resources for mutually beneficial projects.
- Our members and partners share knowledge and decision-making in the co-investment process. This leads to greater impact for growers through the development of larger, longer-term projects with benefit across industries.
- 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.

Performance measures

- The PBRI collaboration continues to be of value to its members.
- The biannual Plant Biosecurity Research Symposium is a highly regarded plant biosecurity knowledge-sharing and networking event.
- MOU partnerships are valued and maintained.

Independent Review

“These partnerships have served as the foundation for enabling PBRI’s membership to connect and engage with a wider pool of knowledge and capability for supporting plant biosecurity RD&E initiatives” — AgEcon, 2023



Key Focus Areas



The Key Focus Areas provide a clear framework for PBRI members to coordinate our collective priorities, which guide concept development and investment in RD&E

Investments may align to more than one Key Focus Area. The proportion of investments may vary between Key Focus Areas.

1. Early warning and risk

Pests, diseases and weeds may be introduced into Australia through natural dispersal patterns or by regulated and unregulated pathways. Understanding how the risk of introduction may be influenced by factors such as seasonal conditions, wind patterns, people and commodity movement is central to this Key Focus Area.

Outcome

Industry is better prepared for the arrival of a biosecurity threat.

Potential investments

- Understanding pest introduction pathways, and the relative risks associated with these pathways.
- RD&E which identifies where new biosecurity measures are required to prevent the arrival or spread of a plant pest.
- Intelligence gathering offshore for emerging global pests and the potential for their introduction and establishment in Australia.
- Quantifying the economic, social and cultural impact of key pests to inform RD&E investment and response.
- Assessing and responding to changing threat status in relation to biology and distribution due to climate change.



Key Focus Areas



2. Diagnostics and surveillance

The timeliness of detection and diagnosis of pests can greatly increase the chance of containment and subsequent eradication. Cost-effective and coordinated surveillance activities will support early detection of biosecurity threats, provide evidence for market access, and assist in targeted pest and insecticide resistance management strategies.

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.

Outcome

Rapid, accurate and cost-effective detection of high priority pests and diseases and early and accurate diagnosis enables a rapid response, reducing impact on production and protecting access to domestic and international markets.

Potential investments

- Smart, cost-effective technologies and platforms to support early detection, surveillance, and timely response, e.g., sensors and smart traps.
- Diagnostic network and architecture for data sharing and data management.
- Insecticide resistance monitoring across plant industry sectors.



Key Focus Areas

3. Resilient crop protection systems

The ongoing challenge of pesticide resistance and the increasing withdrawal of chemicals that have been relied on in the past, requires RD&E to support Australian plant industries' response to pest threats and to minimise their impact on the environment. Managing pests requires control options that comply with domestic and international guidelines and managing pests in proximity to natural environments requires compliance with environmental guidelines.

Outcome

Industry is ready to respond to pest, weed and disease threats with measures that meet trading partner requirements and environmental legislation.

Potential investments

- Cross-industry approaches to managing chemical resistance.
- Systems approaches to developing sustainable (cost effective and compliant) control options for pests, weeds and diseases.
- New tools for the pre-emptive management of spray-drift.

3



Key Focus Areas

4. Readiness and recovery

In Australia, plant industries experience many challenges to their business operations that may affect their future sustainability. These challenges include adverse seasonal conditions, rising costs of fuel and equipment, labour shortages, trade compliance and pest and disease management.

A biosecurity incursion is another challenge to a sustainable business practice with several recent experiences in Australia resulting in significant economic and social costs to growers and their communities, including varroa mite of bees, fall armyworm in maize and sweetcorn, and leaf miner in vegetables.



4

This Key Focus Area will include investments that support industry's ability to respond to biosecurity threats and to continue their business operations post incursion. To further support industry, the PBRI will play a role in contributing to Australian biosecurity expertise and capability through investments in targeted RD&E projects, training and activities.

Outcome

Plant industries are equipped with tools, knowledge and expertise to identify and respond to biosecurity threats on farm.

Potential investment

- Developing biosecurity plans that address business recovery and continuity.
- Delivering cross-sectoral simulation exercises and scenario planning for readiness and recovery.
- Identifying barriers and incentives to adoption of good biosecurity practices using behavioural sciences.
- Promotion of extension networks as first detectors and in preparedness, response, and recovery, e.g., the cross-industry Biosecurity Extension Community.
- Offshore training and capacity building in countries where high priority pests are present.
- Programs targeting First Nations engagement.



Strategic partnerships

The PBRI values working with strategic partners to better support investment and delivery of RD&E in biosecurity across industries. Over the next five years, we expect these partnerships to grow and diversify as we continue to support a biosecure future for our industries.

The benefits of collaboration and partnerships for PBRI are:

- Being more efficient in using grower levies by complementing partners' investments and avoiding duplication of effort.
- Utilising the collective power of multiple organisations working together on similar biosecurity objectives.
- Sharing knowledge in biosecurity research occurring in other sectors, to refine and optimise future investment in RD&E for plant industries.
- Leveraging investment and innovation in biosecurity research to develop large scale projects, to create greater impact for industry.
- Consolidating the role and visibility of PBRI in a global and national context.

Existing partnerships



ACIAR:

The Australian Centre of International Agricultural Research (ACIAR) is the Australian Government's specialist agricultural research-for-development agency. The partnership between ACIAR and the PBRI will lead to RD&E focused on understanding the biosecurity threats in neighbouring regions that will inform preparedness and prevention programs in Australia. Experience and knowledge will be shared between neighbouring countries, aimed at reducing the risk of biosecurity threats to agriculture and the environment.



B3 New Zealand:

Better Border Biosecurity (B3) is a science-based collaboration, underpinning the vitality of New Zealand's natural and productive plant landscapes

and industries, through a research-industry-government partnership delivering world-leading science and technology development. Trans-Tasman connections between PBRI and B3 NZ operate through collaboration on biosecurity research, development and extension. Both partners are committed to working together to deliver plant biosecurity research of benefit to both countries.



Euphresco:

Euphresco is a network of mostly European organisations that fund research projects and coordinate national research in plant health, avoiding duplications. PBRI's partnership with Euphresco enables the sharing of knowledge and plant health activities between countries on common pest threats to agriculture and native environments, which contributes to efficiencies in research investment.



PHA:

Plant Health Australia (PHA) is the national coordinator of the government-industry partnership for plant biosecurity in Australia to minimise pest impacts in Australia, enhance market access, and contribute to industry and community sustainability. The PBRI and PHA coordinate RD&E priorities based on PHA's role in plant biosecurity preparedness and response activities.



PHC:

The Plant Health Committee (PHC) is the peak government plant biosecurity policy and decision-making forum. Its role is to maintain and improve plant health in Australia in support of the economy, environment and community through strategic policy, technical and regulatory advice, and national leadership on plant biosecurity matters. Regular consultation with the states and territories and the Commonwealth through the PHC ensures PBRI coordinates RD&E in collaboration with the jurisdictions.

Our drivers



Skilled workforce

A skilled biosecurity workforce is critical to protect our plant industries and environment from unwanted incursions of pests, weeds and diseases. Through targeted and efficient RD&E investment, the PBRI will contribute to ensuring Australia has the right expertise in our workforce to protect plant health. This strengthens our ability to respond to threats and reduces our dependency on expertise from other countries for the diagnosis and management of new pests.



Climate change

The globally changing climate causes an increased frequency of extreme weather events. It is also altering the habitat, range and distribution of many pests, weeds and diseases that affect plant health, as well as increasing their ability to spread and establish in new areas. This will have flow-on effects to biosecurity management, through changes to pest dispersal pathways, pest monitoring and management, and will potentially influence trade and passenger travel patterns.



First Nations engagement

Valuing First Nations cultural heritage and respectful engagement with First Nations communities is essential to Australia's social and economic success. Engagement with First Nation Communities in biosecurity will be facilitated through linkages to the Indigenous Ranger Program supporting plant biosecurity surveillance and building capacity and capability in northern and regional Australia.





Trade

Australia's supply chains, trading partners and demand for goods continuously evolve and increase in complexity. Multiple factors influence trading patterns including regulatory requirements, climate change, technological advances and geopolitics. The increased movement of people, equipment and goods increases biosecurity risks, by providing more opportunities for pests, weeds and diseases to spread. As a trading nation, safe trade is critical to Australia's plant production sector.



Risk pathways

The risk pathways for entry of a plant pest into Australia are cargo or shipping containers, air freight, mail, international travellers and dispersal of insects, seeds or pathogens on wind currents, rain droplets or the natural movement of insects and vector-borne disease. Risk pathways are dynamic. We therefore must have a dynamic response to minimise the risk to our plant industries.



Sustainability

Sustainability status will increasingly affect consumer purchasing decisions and trading partner requirements. Plant industries operating with sustainable business practices will be an expectation. Meeting these requirements presents competitive advantage opportunities and areas for more efficient RD&E investment. There are reputational risks if expectations are not met. Additionally, regulation of chemical use has led to the withdrawal of many chemicals from the market, and increased effort to develop pesticides with specificity to the target pest.



PLANT BIOSECURITY RESEARCH INITIATIVE

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.

Acknowledgement of country

PBRI acknowledges the Australian Aboriginal and Torres Strait Islander peoples as the traditional custodians of the lands where we work, live and learn.

Image Credits

Page 9 – Callum Wesley. Photo: Evan Collis Photography/GRDC.

Page 10 – Image courtesy South Australian Wine Industry Association. Photo: John Kruger.

Page 20 – Photo: Arthur Mostead.

Page 21 – Photo: Getty Images.

*Page 23 – Fall armyworm (*Spodoptera frugiperda*) (Source: Daniel Rodriguez, UQ).*

Disclaimer

PBRI has taken all reasonable care to ensure that the information contained within this strategy is accurate at the time of publishing (February 2024). 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.