

# PLANT BIOSECURITY RD&E PRIORITIES FORUM PROCEEDINGS

July 2016

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“The best minds from across research, industry and government should formulate a set of high level priorities and corresponding important research challenges for Australia.

These challenges should be practical problems that capture the imagination of our research and business communities” – from the Australian Government report, *Boosting the Commercial Returns from Research* (2014).





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**Australian Government**  
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## Foreword

The National Plant Biosecurity RD&E Strategy Implementation Committee is pleased to present the proceedings of the inaugural Plant Biosecurity RD&E Priorities Forum which was held at AgriBio in Melbourne on 14 and 15 July 2016.

This forum was held to identify ways to maximise the benefits of scientific research for Australia's crop producers, with a particular emphasis on projects on cross-sectoral pests – those that attack the crops of more than one industry.

The meeting is significant since it is the first time that researchers have come together with plant peak industry bodies, research development corporations, government policy makers and regulators in order to discuss ways of enhancing cross sectoral plant biosecurity RD&E. This collective input embodies the intent of the National Primary Industries RD&E Framework.

The Forum was attended by around 90 people who heard from experts in plant biosecurity from a policy, regulatory and R&D perspective and had an opportunity to contribute their particular perspectives on potential collaborative opportunities.

Currently the Research and Development Corporations tackle biosecurity issues that are of concern to producers of particular crops. Yet cross-sectoral pests could be researched more efficiently by cooperating across these research silos. *Xylella fastidiosa* is one example. This exotic bacterial pest is currently spreading around the world and is so far known to affect some 200 species of plants. *Fusarium oxysporum* is another that causes production difficulties for cotton, bananas and many other horticultural and agricultural industries.

In addition to increased production costs, the presence of pests in our production areas can restrict domestic and international market access. There is much at stake. Australia needs to do all that it can to best protect our environment and production industries from serious pests such as these and this includes increasing efficient use of our valuable research dollars.

The following pages cover the activities of the workshop and the outcomes that arose from the participative sessions.

Thank you to those who attended and contributed their expertise to the success of this inaugural Forum. The outcomes of the workshop session will be analysed and considered by the Implementation Committee, which will then progress the cross-sectoral opportunities to ensure the valuable input gained from the Forum is not lost.



Greg Fraser

Chair

National Plant Biosecurity RD&E Strategy Implementation Committee

August 2016

## About the National Plant Biosecurity RD&E Strategy Implementation Committee

Plant biosecurity is a set of measures which protect the economy, environment and community from the negative impacts of plant pests and diseases.

A fully functional and effective biosecurity system is a vital part of the future profitability, productivity and sustainability of Australia’s plant production industries and is necessary to preserve the Australian environment and way of life. Research, development and extension (RD&E) is a vital part of an effective plant biosecurity system.

In Australia there are many different organisations that conduct plant biosecurity RD&E, including universities, government agencies, botanic gardens, museums, plant based industries and private organisations. Due to the large number of organisations involved, it is important to minimise duplication of work and identify gaps to ensure an efficient, coordinated and responsive RD&E system to support plant biosecurity.

To this end, the National Plant Biosecurity RD&E Strategy (the ‘strategy’) was developed in 2013 under the National Primary Industries RD&E Framework. This strategy is one of 22 sector specific and cross-sectoral strategies being implemented under the Agriculture Senior Officials Committee (Figure 1).

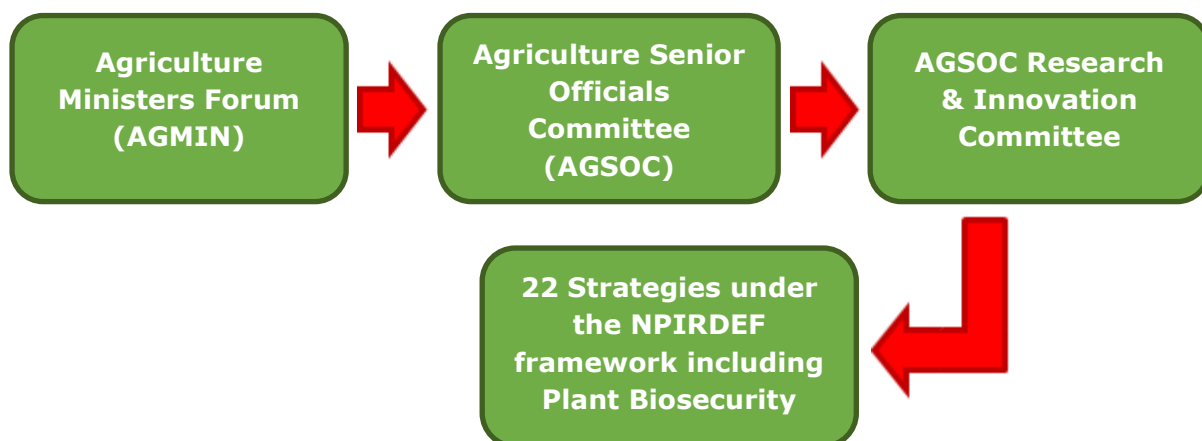


Figure 1: Structure of the NPIRDEF Framework.

## Aims of the National Plant Biosecurity RD&E Strategy

The strategy aims to better harmonise the roles of the organisations involved in RD&E related to plant biosecurity, ensuring that all stakeholders work together to maximise benefits to Australia. The strategy also addresses specific issues that were raised by stakeholders at a workshop in 2012, including:

- A lack of coordination between jurisdictions, industry, research and development providers and end users, policy makers, regulators and funding bodies.
- Recognition that there was a lack of a coherent system for setting, reviewing and supporting priorities.
- Lack of a focussed and nationally consistent process for the assessment and distribution of R&D findings.
- Lack of a system to assess current capabilities and infrastructure and identify any gaps in meeting current and future needs.
- Excessive reliance on short term funding.
- On-going reductions in capacity and financial resources.

In order to instigate the changes outlined by the strategy a Strategy Implementation Committee was formed. The Implementation Committee includes representatives from Research and Development Corporations, research and regulatory streams of government agencies, Plant Health Australia (PHA), the CSIRO Biosecurity Flagship and the Plant Biosecurity Cooperative Research Centre.

The Implementation Committee formally reports to the AGSOC Research and Innovation Committee, and provides information more widely to a range of stakeholders that have been identified in a Stakeholder Engagement Plan. The Department of Economic Development, Transport, Jobs & Resources (formerly Department of Environment and Primary Industries), Victoria, is the government sponsor and Horticulture Innovation Australia Limited the industry sponsor for the strategy, with PHA providing executive support for the Implementation Committee and the strategy leader.

## Implementation Committee Membership as at 1 July 2016

Name	Organisation
<b>Mr Greg Fraser (Chair)</b>	Plant Health Australia
<b>Mr Mike Ashton</b>	Queensland Department of Agriculture and Fisheries
<b>Dr Gary Fitt</b>	CSIRO
<b>Dr Sharon Harvey</b>	Wine Australia
<b>Mr Tim Lester</b>	Council of Rural Research and Development Corporations
<b>Dr Victoria Ludowici (Executive Officer)</b>	Plant Health Australia
<b>Mr David Moore</b>	Horticulture Innovation Australia Limited
<b>Dr Suzy Perry</b>	Queensland Department of Agriculture and Fisheries
<b>Dr Leigh Pilkington</b>	New South Wales Department of Primary Industries
<b>Dr Kim Ritman</b>	Department of Agriculture and Water Resources
<b>Dr Michael Robinson</b>	Plant Biosecurity Cooperative Research Centre
<b>Dr Shashi Sharma</b>	Department of Agriculture and Food Western Australia
<b>Mr Rod Turner (Strategy Leader)</b>	Plant Health Australia
<b>Dr Simone Warner</b>	Victorian Department of Economic Development, Jobs, Transport and Resources
<b>Dr Ken Young</b>	Grains Research and Development Corporation

## About the Forum

To make the most of research investment, RD&E needs to be strategic, collaborative and well planned. This two-day forum brought together plant industries, regulators, policy makers and research leaders to link national science and research priorities to the needs of plant industries and governments. The forum focused on cross-sectoral R&D opportunities and sectoral R&D that can be applied to other industries. This cross sectoral focus is the point of difference for this Forum.

Organisations were invited to share their perspectives on problems and solutions in plant biosecurity so that research priorities can be aligned with the areas of greatest need.

There were keynote speakers from government, industry peak bodies and research sectors, and workshops to contribute expertise and ideas.

In addition to contributing ideas to the future of plant biosecurity research, the forum provided an opportunity to enhance networks and foster partnerships with others who want to advance plant biosecurity science.

All powerpoint presentations from the forum are available on the Implementation Committee's website: <http://www.biosecurityportal.org.au/rde/pages/home.aspx>.

## Program

### Day 1

Time	Item	Presenter
<b>10:00 AM</b>	<b>Morning tea on arrival</b>	
<b>Opening Plenary</b>		
<b>10:30 AM</b>	Opening remarks and scene setting	Greg Fraser (NPBRDES IC Chair)
<b>10:35 AM</b>	Opening address	Jaala Pulford (Victorian Agriculture Minister)
<b>Session 1: The Big Picture:</b> Keynote speakers from industry and government. Talks covering high priority, cross-sectoral topics. <b>Session Chair:</b> Greg Fraser (NPBRDES IC Chair)		
<b>10:55 AM</b>	Introduction to Session 1	Greg Fraser (NPBRDES IC Chair)
<b>11:00 AM</b>	Biosecurity system & underpinning RD&E	Lyn O'Connell (Deputy Secretary DAWR)
<b>11:20 AM</b>	International market access with reference to IPPC	Lois Ransom (IPPC Bureau chair)
<b>11:40 AM</b>	RD&E needs for industry	Tania Chapman (Chair Voice of Horticulture)
<b>12:00 PM</b>	Session 1 wrap up	Greg Fraser (NPBRDES IC Chair)
<b>12:10 PM</b>	<b>Lunch</b>	
<b>Session 2: Panel discussion:</b> How to better coordinate RD&E- how could we better prepare for future incursions using Fusarium diseases as case studies <b>Session Chair:</b> Mike Ashton (QDAF)		
<b>1:10 PM</b>	Introduction to Session 2	Mike Ashton (QDAF)
<b>1:15 PM</b>	<b>Learnings from different sectors:</b> Banana industry Cotton industry (Fusarium and Verticillium wilt outbreaks) State government RDC Commonwealth	Doug Phillips (ABGC) Susan Maas (Cotton RDC)  Suzy Perry (QDAF) David Moore (HIAL) Kim Ritman (Australian Chief Plant Protection Officer, DAWR)
<b>1:40 PM</b>	Facilitated discussion	Lloyd Kingham (NSW DPI), Facilitator
<b>2:40 PM</b>	Session 2 wrap up	Mike Ashton (QDAF)
<b>2:50 PM</b>	<b>Afternoon tea</b>	

<b>Session 3: The Bleeding Edge:</b> fast developing science with high potential to improve the ways biosecurity is managed <b>Session Chair:</b> Martin Barlass (PBCRC)		
<b>3:20 PM</b>	Introduction to Session 3	Martin Barlass (PBCRC)
<b>3:25 PM</b>	Risk Management: how are we prioritising our surveillance to minimise risk?	Andrew Robinson (CEBRA)
<b>3:45 PM</b>	Advanced genetic technologies for improved diagnostics and surveillance	Noel Cogan (DEDJTR)
<b>4:05 PM</b>	Integrating science, people and policy – enabling innovation and impact for biosecurity sciences	Cathy Robinson (CSIRO)
<b>4:25 PM</b>	Session 3 wrap up	Martin Barlass (PBCRC)
<b>4:35 PM</b>	Wrap up of Day 1	Rodney Turner (NPBRDES IC Strategy Leader)
<b>4:50 PM</b>	<b>Day 1 Close</b>	

## Day 2

Time	Item	Presenter
<b>8:00 AM</b>	<b>Tour of AgriBio and Tea on arrival</b>	
<b>Overview</b>		
<b>8:45 AM</b>	Overview of day 2	Lloyd Kingham (NSW DPI), Facilitator
<b>Session 4: Government's role:</b> How are governments using RD&E to reduce risk, and enhance market access? <b>Session Chair:</b> Gary Fitt (CSIRO)		
<b>8:55 AM</b>	Government roles and responsibilities, issues and challenges, future direction, R&D landscape in biosecurity and pest prioritisation	Kim Ritman (Australian Chief Plant Protection Officer, DAWR)
<b>9:25 AM</b>	Government and industry using RD&E to facilitate market access	Geoff Raven (PIRSA)
<b>9:45 AM</b>	Plant biosecurity challenges and RD&E needs	Mark Whattam (DAWR)
<b>10:05 AM</b>	Session 4 wrap up	Gary Fitt (CSIRO)
<b>10:15 AM</b>	<b>Morning tea</b>	

<b>Session 5: How to prioritise plant biosecurity RD&amp;E for national benefit industry, government and research perspectives</b> <b>Session Chair:</b> Lloyd Kingham (NSW DPI), Facilitator		
<b>10:45 AM</b>	NPBRDES- Cross-sectoral plant biosecurity analysis	Victoria Ludowici (NPBRDES IC Executive Officer)
<b>11:00 AM</b>	<b>Workshop:</b> National Priorities: what are the biggest priorities across multiple sectors? How do we improve capacity, engagement, infrastructure, technology	
<b>12:45 PM</b>	Wrap up, where to next	Greg Fraser (NPBRDES IC Chair)
<b>1:00 PM</b>	<b>Lunch</b>	
<b>2:00 PM</b>	<b>Close</b>	

## Session 1

The chair of the first session was Greg Fraser, the Chair of the National Plant Biosecurity RD&E Strategy Implementation Committee, and Executive Director and CEO of PHA. He provided an overview of the forum, outlining the aims and objectives being sought.

### Minister Jaala Pulford (Victorian Minister for Agriculture)

The RD&E Priorities Forum was opened by Minister Jaala Pulford, Victorian Minister for Agriculture. The Minister highlighted the importance of protecting Victoria’s agricultural and environmental assets from biosecurity threats. In particular, she highlighted the importance of protecting agricultural and environmental assets from plant pests and diseases to ensure that Australia continues to maintain and grow our food and fibre industries.

Minister Pulford also emphasised the Victorian Government’s recognition of the importance of biosecurity, and how the maintenance of high biosecurity standards underpins product quality and the integrity elements of Brand Australia both in domestic and global markets.

### Ms Lyn O’Connell (Deputy Secretary, Department of Agriculture and Water Resources)

Ms O’Connell broadly covered the Australian plant biosecurity system and its underpinning RD&E. She discussed regional differences, roles of regulators and researchers, and commented on the value and need for the forum.

Australian agricultural exports are worth more than \$43 b annually and need to be safeguarded against threats including biosecurity threats. She believes Australia needs to drive the world in science and biosecurity to safeguard these exports and to support and maintain the clean and green image of Australian agriculture. This image gives Australian products a market advantage. Ms O’Connell advocated for stakeholders to aim to improve Australia’s biosecurity system and she highlighted three questions the Department of Agriculture and Water Resources would like the Forum to consider:

1. Are we effectively managing the plant biosecurity risks?
2. Are we being a reasonable regulator?
3. Is there a better way of doing this?

She believes Department of Agriculture and Water Resources should aim to be a fully effective regulator but one that is less visible to its stakeholders.

### Ms Lois Ransom (International Plant Protection Convention Bureau Chair)

Lois Ransom talked about International Market Access with reference to the International Plant Protection Convention (IPPC) focussing on protecting the worlds plants from pests and diseases. She provided an overview of the global agreement that makes up the IPPC. Her main focus was about connecting Australian RD&E with global systems, procedures and management.

Ms Ransom advocated for researchers to look at biosecurity issues more broadly and rather than concentrating solely on the RD&E outcomes within Australian systems, to look at the issues, and the outcomes from a global perspective. The importance of published scientific evidence to underpin trade and the need for equivalence was highlighted. The need for strong E (extension) as part of research outcomes was emphasised.

She talked about ISPM 28 as the international framework and guidance for approval of international standards. At the conclusion of her presentation she invited those in the room to think about leaving a lasting global legacy through their work, and the importance of international collaboration as a mechanism to share finite resources.

### Ms Tania Chapman (Chair - Voice of Horticulture)

Tania Chapman presented in her role as Chair of the Voice of Horticulture. Drawing on pest examples from the citrus (Huanglongbing) and banana (Panama disease) industries, she discussed the importance of rapid, accurate diagnostic testing. She spoke on the critical need for investment in diagnostic and surveillance capabilities and the potential risks associated with increased imports.

Ms Chapman discussed the opening up of Northern Australia to agriculture, and the potential increased risk this will create by providing ‘stepping stones’ for pests and diseases to move to southern states.

The issue of multiple meanings of the term “shared responsibility” was raised. Ms Chapman spoke of a need for better communication across the biosecurity system, rather than in silos. Industry currently has no formal mechanism to contribute to policy development and RD&E is being duplicated across communities. There is a for extension of research both with industry and the broader community.

She postulated that through the National Primary Industries Research Development and Extension Framework there is an opportunity to develop a truly national system.

## Session 2

The second session, How to better coordinate RD&E, was a panel discussion facilitated by Session Chair Mike Ashton, Chief Plant Health Manager, Biosecurity Queensland. It consisted of a number of speakers providing their views on improving prepared for future incursions, using *Fusarium* disease as a case study.

The speakers were: Doug Phillips (Chairman, Australian Banana Growers’ Council) Susan Maas (Cotton R&D Program Manager, Cotton Research and Development Corporation), David Moore (General Manager, Research, Marketing & Investments, Horticulture Innovation Australia Limited), Dr Kim Ritman (Australian Chief Plant Protection Officer, Department of Agriculture and Water Resources). Dr Suzy Perry (Science Leader - Plant Biosecurity, QDAF) unfortunately was unable to attend.

One of the key findings highlighted in this session were the problems associated with failing to make decisions early in an emergency incursion situation. The Forum was advised by the panel that no decision is often the worst decision. In most circumstances decisions must be made in the absence of complete data. It was suggested that industries should be working together to prepare for incursions, and that there is a need for basic R&D to be done in advance, such as the optimal chemicals and treatment methods to use for decontamination. Speakers agreed that collaboration is critical to the success of all emergency responses.

There was discussion around successful engagement and communication campaigns. Considerations included ways to invigorate key messages, what are the drivers that will lead to successful engagement in the face of challenges such as reducing property values. It is critical to identify the drivers to increase the level of engagement, reporting and compliance with regulations. Without this understanding the stakeholders will potentially disengage or, worse, work against the objectives of the response.

Susan Maas highlighted that the key learning from the emergence of cotton wilt from native *Gossypium* species, was the need for both short term solutions to aid eradication and containment but also the need for longer term solutions such as resistance breeding. There were also discussions on the farming system balance and how solutions were business decisions, not research focused. It was noted industry needed a balance of RD&E to support both short and long term needs and that some focus should be given to the benefit/cost of RD&E in each area, based on business needs and opportunities available to manage an incursion.

The Australian Government focuses on risks associated with pests with a wide ranging impact but without a defined pathway<sup>1</sup>, people movement, large numbers of exotic pests, pathogen vectors and the need for better diagnostic tests including in soil testing and rapid diagnostics. Kim Ritman highlighted the large volumes of material entering the country which is screened by the department and illustrated the risk with statistics on the volumes and types of material intercepted at the border. Kim Ritman used this information to highlight the constant pressure on the system and the need for RD&E to assist managing this risk.

The discussion finished with the Forum participants agreeing that there was a need to find the enablers in the room and garner a shared purpose to enable high priority RD&E to be determined and funded.

### Session 3

Session 3 was about fast developing science with high potential to improve the ways biosecurity is managed, and was chaired by Martin Barlass, the Chair of the PBCRC board.

#### Dr Andrew Robinson (Deputy Director, Centre of Excellence for Biosecurity Risk Analysis (CEBRA))

Andrew Robinson provided an overview of what CEBRA does, and can do, and enthusiastically demonstrated the power of statistics for managing and predicting biosecurity risks. He characterised his approach with clients to begin with questions around 'what keeps you awake at night' to pinpoint the exact issues at hand and then develop innovative solutions.

#### Dr Noel Cogan (Senior Research Scientist, Department of Economic Development, Jobs, Transport and Resources)

Noel Cogan provided an overview of the capabilities of the AgriBio facility in gene sequencing and the possibilities of a new world of rapid diagnosis. He gave some examples of in-field sequencing for viruses such as Zika and Ebola, and the opportunities opening up with iPhone technology interfaces, and reducing costs of next generation sequencing technologies.

Another area highlighted was the ability of researchers to sample multiple mosquitoes and sequence the DNA of the resulting 'mosquito soup' and identify all mosquito species present in the sample. DEDJTR are currently looking into simultaneous sequencing of all viruses carried by the mosquitoes in the same sample used to identify the species.

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<sup>1</sup> e.g. tramp ants, which can enter Australia by many mechanisms and with goods not previously considered risky such as new machinery

### Dr Cathy Robinson (Principal Research Scientist, CSIRO)

Cathy Robinson is a social scientist with CSIRO who provided an overview of her research undertaken as part of a PBCRC project. Dr Robinson highlighted the materials that have been developed through this work. This presentation followed on from the panel session where the panellist indicated there was a need to develop tools and techniques to engage with stakeholders. Dr Robinson is interviewing stakeholders involved in current incursion response incidents to determine what tools or techniques could be used to get them to engage with the response. Communication is increasingly being recognised as an important component of a response plan.

## Session 4

Session 4 was a session focused on governments RD&E needs, and how governments use RD&E to reduce risk, and enhance market access. The session was chaired by Dr Gary Fitt (Science Director, CSIRO).

### Dr Kim Ritman (Chief Plant Protection Officer, Department of Agriculture and Water Resources)

Kim Ritman, spoke about the Australian Government's roles and responsibilities, issues and challenges. He provided insight into the future RD&E landscape in biosecurity and provided information on a pest prioritisation project that had been undertaken by the Department of Agriculture and Water Resources.

The project focused on objectively examining all the high priority pests identified in PHA's biosecurity plans for individual industries and combining these with the high priority environmental and hitchhiker pests identified by the department to identify priorities for action. The work resulted in identifying 42 high priority pests. Dr Ritman then used three different case studies to demonstrate the strategic context for R&D.

### Mr Geoff Raven (Manager of Plant and Food Standards, Primary Industries and Regions South Australia)

Geoff Raven gave a state government perspective on how government and industry use RD&E to facilitate market access. He stressed that market access priorities, and thus market access RD&E needs, always need to be driven by industry needs/demands. Industry needs to have an understanding of their both current and potential markets. He also advised that for each jurisdiction there would be differing market access priorities given the different industries in each jurisdiction. Market access aspirations of industry cover both domestic and international market access requests.

Mr Raven suggested that we need to look outside of the square with regards to the process of gaining market access. Are there better, faster, more agile ways of facilitating market access outside of the current laborious, and time consuming prioritisation and market access process? He talked about the quality, safety and integrity aspects of production that are important marketing messages for Australian produce, as we are unable to compete on price alone. Readily available data packs, ready to go were required so we are fully prepared for in-bound delegations. Overseas delegations want to see data and we need to provide a demonstration of the scientific evidence needed. Industry and government need to work together to determine which market access requests will be progressed as each request requires significant effort from each of the stakeholder groups.

### Mr Mark Whattam (Operational Science Services, Department of Agriculture and Water Resources)

Mark Whattam discussed the plant biosecurity challenges and RD&E needs of the Australian government, from an operational science perspective. He highlighted the increasing risks associated with increasing volumes of plant materials being imported, increasing passenger numbers and cargo imports. He outlined Operational Science Services capabilities and the fact that in the future they may be looking at doing in house R&D. Mr Whattam provided examples of where plant biosecurity had assisted the department and industry.

The PBCRC has developed a virus screening test where multiple viruses can be screened at one time thus reducing the need for individual tests for each virus. This has enabled the Australian Government to reduce the time some high risk plant species spend in post entry quarantine. This is a win for the department in that they can screen more material and a win for industry in that they get their material cleared faster. He ended his session with some discussions on challenges and opportunities for RD&E in the plant biosecurity operational area.

## Session 5

The final session was facilitated by Lloyd Kingham, a facilitator from NSW Department of Primary Industry. The aim of this session was to utilise the broad experience in the room and to prioritise plant biosecurity RD&E for national benefit industry, government and research perspectives.

## Dr Victoria Ludowici (Executive Officer, National Plant Biosecurity RD&E Strategy Implementation Committee)

Prior to the workshopping session, Victoria Ludowici provided an overview of a Cross Sectoral Analysis of R&D projects that are contained in the National Plant Biosecurity Status Report (NPBSR)<sup>2</sup>. The majority of the 578 projects from the NPBSR (64%) were considered to be sectoral, meaning relevant plant hosts are covered by a single RDC. Almost one fifth of the projects were sectoral but could possibly be applied to other sectors with further R&D.

Dr Ludowici also highlighted the gaps in surveillance, diagnostics and preparedness material for some cross-sectoral pests. One of the key message from Victoria's presentation is that significant opportunities exist for applying RD&E across different sectors.

### About the workshop

The facilitator, used an app<sup>3</sup> to ask the participants to provide answers for three questions:

1. What current sector specific plant biosecurity projects are you doing that would benefit from a collaborative approach?
2. What potential sector specific projects could you do that would benefit from a collaborative approach?
3. What potential cross-sectoral projects would benefit from a collaborative approach?

The answers provided by the participants were then grouped into the following themes:

- individual pest issues including- melon necrotic spot, tomato potato psyllid, birds and floral diseases causing fruit and postharvest rots
- whiteflies
- bee health
- improving collaboration
- social science and extension
- using existing research to develop industry management plans for endemic pests
- response plans using Xylella as an example
- using cross-sectoral/international platforms for research funding
- diagnostics
- surveillance
- market access
- modelling and risk analysis
- portals and bodies of knowledge

<sup>2</sup> The Cross Sectoral Priorities analysis of the Plant Biosecurity Research, Development and Extension System is available at the Implementation Committee's website:  
<http://www.biosecurityportal.org.au/rde/pages/home.aspx>

<sup>3</sup> PollEverywhere- <https://www.polleverywhere.com/>

- next generation sequencing and variety resistance.

Participants were then asked to select a group of responses and use a problem solving approach to outline an action plan that could be considered by the National Plant Biosecurity RD&E Strategy Implementation Committee on how to address the issue. The process followed a SMEAC process. SMEAC is an acronym and stands for:

- Situation: 3 sentences to describe the situation – the same way you would describe the situation in a brief to senior management or the Minister.
- Mission statement: one sentence to define what we do.
- Execution: how do we do it?
- Administration: what is required for administration?
- Command and control: who hosts this and where, and who should have the responsibility?

The outcomes chosen during the group exercise are below, with raw data at <http://www.biosecurityportal.org.au/Pages/rdelanding.aspx>.

### Social science and extension

Currently much R&D is not being extended to end users effectively due to a lack of communication between the stakeholders in the plant biosecurity system. In addition, researchers are not always best equipped to deliver their research findings to the intended audience.

Extension is a skill in its own right and currently there are missed opportunities and poor engagement with some stakeholders. A greater understanding of the interactions within the plant biosecurity system is needed. Areas where adoption of biosecurity practices and technology are working should be studied and where possible replicated into other areas of the system.

Business drivers for the different participants in the plant biosecurity system need to be understood. Workshops could be run to understand the needs of the different sectors of the biosecurity continuum and to develop targeted extension strategies.

### Using existing research to develop industry management plans for endemic pests

There are knowledge gaps in biology, ecology and management of pests and diseases across all plant industries. Gaps that could be addressed through a cross-sectoral approach include:

- pest ecology on wild and alternate hosts,
- pathogen interactions with soil microbial communities,
- surveillance,
- control of pests and diseases,
- understanding spatial and temporal distribution of pests and diseases.

In order to address these areas, workshops of experts should be carried out to identify gaps and develop cross-sectoral projects to find solutions. The Australian Government, relevant RDCs, Plant Biosecurity CRC, state agriculture departments and universities should be involved.

### Response plans using *Xylella* as an example

Contingency and response planning was identified as a priority for:

- *Xylella* (*Xylella fastidiosa*) and its vectors,
- brown marmorated stink bug (*Halyomorpha halys*),
- navel orange worm (*Amyelois transitella*),
- huanglongbing (*Candidatus Liberibacter asiaticus*, *Ca. L. africanus* and *Ca. L. americanus*) and its vectors.

Since *Xylella* was identified as a priority it was selected as a case study for response planning. Currently there is no response plan for *Xylella* and its vectors. This pest has the potential to affect multiple industries and a cross-sectoral management approach will be needed to minimise the impact this pest may have if it enters Australia.

To boost preparedness, the following actions were identified:

- a gap analysis,
- assessment of entry pathways,
- diagnostic protocols (including rapid diagnostics),
- community engagement plans,
- treatments and containment measures for vectors and the pathogen registered or developed,
- surveillance plans (both general surveillance and delimiting surveillance),
- policies for immediate response,
- an economic impact analysis.

The workshopping group identified PHA, the National Plant Biosecurity RD&E Strategy Implementation Committee, affected industries, state and federal government and the community as stakeholders, with the Department of Agriculture and Water Resources, PHA and industry identified as leaders. It was noted that a workshop hosted by PHA (funded by Department of Agriculture and Water Resources) had begun work in this area, this list will guide further steps.

### Using cross-sectoral/international platforms for research funding

Biosecurity is increasingly an international issue with knowledge and information changing rapidly due to increased risks posed by greater global movement of goods and people. International partnerships are required to reduce risk and prepare for potential incursions.

An international biosecurity group needs to be formed with links to and leadership from IPPC, with required resourcing. Governments, universities, industries and other organisations that employ research staff will need to be involved. The process will also need leadership from IPPC's expert working groups.

## Diagnostics

A need was identified for development and application of new technologies for plant pests including next generation sequencing (NGS), high throughput diagnostics, diagnostics for early detection and tests for soilborne pathogens. There is also a need for rapid field tests and a greater understanding of pest biology. Currently there is a lack of nationally endorsed diagnostic protocols, reference collections and positive controls for exotic pests. It was noted that international diagnostic protocols need to be developed and tested nationally to take into account endemic species which may produce false positives.

In order to address these concerns, it was proposed that expert groups with knowledge of related endemic species are formed for different pest species. To support diagnosticians, reference collections need to be established and maintained and data from existing research projects should be captured and registered, including metadata and data from PhD projects.

Projects to develop rapid field tests for non-experts should be carried out along with research into pest biology particularly mechanisms behind pathogenicity. The Department of Agriculture and Water Resources and Plant Health Committee were nominated to lead this process.

## Surveillance

Currently surveillance is carried out in an ad hoc and reactive manner. It is not prioritised when funding resources are low and there are disincentives to disclose information between organisations and other sectors. There is a need to develop surveillance tools that allow for efficient surveillance by all parties including industry. Such tools include smart traps, automated surveillance, effective lures for insect pests and vectors and technology for early and rapid detection.

Improvement is needed in the way surveillance data is collected with nationally endorsed policies and frameworks to support data driven surveillance.

Policies, frameworks and resulting strategies should be incorporated into on-farm biosecurity plans and manuals.

Surveillance should be incentivised for industry and the community and the barriers to participation need to be better understood. Training and third party certification should be prioritised.

PHA, the Subcommittee on National Plant Health Surveillance and the National Plant Biosecurity RD&E strategy were nominated to lead the process.

## Market access

With import standards and treatment protocols often unavailable, Australia's plant industries are unable to meet some export market requirements. Consequently, markets are not being accessed efficiently or consistently across different countries, states and commodities. The lack of international standards and protocols affects market access within the domestic Australian market.

A gap analysis of key market access pests, commodities and markets is required. A prioritisation framework should be developed and in conjunction with the results of the gap analysis, evidence can be gathered to develop protocols and standards to allow for access for a single treatment across all markets.

Current markets open to commodities should be identified with protocols and standards harmonised across these different markets and commodities where possible. This approach will require co-investment between government and industry.

The existing capability and capacity is adequate however a committee lead by the Department of Agriculture and Water Resources should be formed to approach and engage the states, RDCs and industries to conduct work.

## Wrap up

Key findings:

- Biosecurity is increasingly an international issue.
- Our mission is to create national partnerships to minimise global biosecurity risks.
- Need for harmonisation of market requirements.
- Few international standards to address domestic and international market access.
- Develop diagnostic expert networks for key pest groups.
- Develop diagnostic tools for the top 42 biosecurity threats required.
- Develop active cost effective pathway driven real time surveillance for HPPs.
- Develop tools to validate citizen science.
- Improve engagement with community during incursions.
- Model spatial and temporal patterns for the movement of pests.
- Develop preparedness plan for Xylella to be implemented in the event of an incursion of this serious exotic pest.
- Identify key overseas researchers for high priority pests and make a gap analysis of RD&E.
- Extension is within the scope of the strategy.
- Building trust is key.
- Need to capture on-farm surveillance information accurately and consistently to substantiate pest freedom and define infected areas in an exotic pest incursion.

## Recommendations

There were two outcomes being sought from this inaugural Forum. The first was to provide a networking opportunity for stakeholder groups that normally don't meet, so that they can build relationships and discuss opportunities for cross sectoral Plant Biosecurity RD&E. Evaluation showed most attendees saw this as the biggest benefit of the Forum.

The second outcome was for the wide range of stakeholders present—industry peak bodies, researchers, RDC representatives, policy makers and regulators—to work together to discuss the high priority cross-sectoral pests that can be targeted. It was to identify the threats that “keep you awake at night”.

Not all of the priorities identified in the first workshop session were chosen by participants to develop further. Those that were developed further were:

- social science and extension
- using existing research to develop industry management plans for endemic pests
- development of Response Plans using *Xylella* as an example
- using cross sectoral/international platforms for research funding
- diagnostics
- surveillance
- market access.

Each of the priorities will be further analysed by PHA and opportunities for collaboration will be developed.

The opportunities identified will be presented to the Implementation Committee for consideration and prioritisation.

National Plant Biosecurity RD&E Strategy Implementation Committee will determine linkages with other projects. An example of this is that DAWR is currently undertaking work to improve Australia's capability to manage an incursion of *Xylella fastidiosa* (*Xylella*). The outputs from the priority *Development of Response Plans using Xylella as a case study* will be provided to the group/s working on *Xylella* to assist them in assigning priorities.

The output of the work on Diagnostics and Surveillance will be provided to the Subcommittee on Plant Health Diagnostics and the Subcommittee on National Plant Health Surveillance for consideration and incorporation into their work plans.

The Implementation Committee is also looking for opportunities to facilitate smaller targeted workshops where the relevant RDCs, governments, industry and researchers are brought together to consider a specific area of work. An example is a workshop on whiteflies and their associated viruses that considers cross sectoral RD&E issues and identifying champions to drive RD&E initiatives, planned to be held in August, 2016.

The Implementation Committee will provide updates on activities generated from the Forum on the Committee's web site.

**<https://portal.biosecurityportal.org.au/Pages/rdelanding.aspx>**

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## Appendix 2: Additional information

Agriculture Ministers Forum

**<http://www.agriculture.gov.au/about/media-centre/communiques/ag-ministers-forum>**

Agriculture Senior Officials' Committee

**<https://www.finance.gov.au/resource-management/governance/register/body/88596/>**

National Plant Biosecurity RD&E Strategy Implementation Committee

**<http://www.biosecurityportal.org.au/Pages/rdelanding.aspx>**

National Primary Industries RD&E Framework

**<http://www.npirdef.org/>**

Intergovernmental Agreement on Biosecurity

**<http://www.agriculture.gov.au/biosecurity/partnerships/nbc/intergovernmental-agreement-on-biosecurity>**





Australian Government  
Department of Agriculture  
and Water Resources

**AgriBio**  
Centre for AgriBioscience



Department of  
Economic Development,  
Jobs, Transport & Resources

**Horticulture  
Innovation  
Australia**



Plant Health  
AUSTRALIA

# National Plant Biosecurity RD&E Strategy

## Implementation Committee Strategic Direction and Plan

STRATEGIC PLAN

STRATEGIC DIRECTION

"The purpose of the AGSOC cross sectoral plant biosecurity RD&E strategy is to enable effective management of economic, environmental and social risks posed by pests that may enter, establish or spread within Australia, by strengthening biosecurity research, development and extension for Australia's plant industries (and those that are dependent on them)"

### VISION

"Australia has world leading science-based systems and capability for safeguarding our plant sector from biosecurity threats"

### KEY RESULT PRIORITY OUTCOMES

Nationally agreed RD&E focus areas (programs) and priorities

Developing and increased linkages and support for the RD&E system

Access to capability, information and resources

### STRATEGIES AND KEY PERFORMANCE INDICATORS

#### Identify and prioritise RD&E

- Cross sectoral RD&E activity identified
- Cross sectoral RDE priorities established and gaps identified
- Cross sectoral RDE collaborations enabled
- Future RD&E needs of the biosecurity system identified

#### Monitor RD&E activities and capability

- Conduct targeted stocktakes of national RD&E capability
- Evaluate investment in emerging technologies and their scope for wider cross sector application
- Monitor capability and capacity of organisations with 'Major' biosecurity roles
- Assist sectoral strategies to identify and access RDE capability and resources
- Identify capability for priority cross sector RDE priorities

#### Engaged and Linked stakeholders

- National workshop held biennial
- Priorities reviewed annually by stakeholders
- Communication and engagement plan implemented
- Cross sectoral RD&E linkages identified
- Report to R&I Committee

#### Enhance knowledge and data management

- Effective acquisition, storage and distribution of RD&E data
- Improved access to and awareness of RD&E activities and outputs

### ANNUAL OPERATIONAL PLAN - ACTIVITIES

Guides business to achieve strategic direction

**National Plant Biosecurity RD&E Strategy's  
Implementation Committee Work Plan for 2016 Calendar Year**

<b>Key Performance Indicator</b>	<b>Activity</b>	<b>Date</b>	<b>Responsibility</b>	<b>Undertake Influence</b>	<b>Status</b>
<b>Identify and Prioritise RD&amp;E</b>					
Cross sectoral RD&E activity identified	Review all sectoral and cross sectoral RD&E plans	End October 2015	PHA	U	Complete
	Review National Plant Biosecurity Status Report by November each year for cross sectoral priority pest RD&E activity	Annually (by November)	PHA	U	
Cross sectoral RD&E priorities established and gaps identified.	Assess PHC priority pest list against impacted sectors	December 2016	DAWR and PHC	I	
	Report identified RD&E gaps and opportunities identified to the committee	Annually (by December)	PHA	U	
Cross Sectoral RD&E Collaborations enabled	A forum held at least biennially to facilitate cross sectoral RD&E actions	July 2016	IC	U	In progress
	Mini workshops conducted on specialised topics	2 per year	PHA + relevant stakeholders	U	
Future RD&E needs of the biosecurity system identified	Contribute to PBCRC system project	As required	IC		

Key Performance Indicator	Activity	Date	Responsibility	Undertake Influence	Status
<b>Monitor RD&amp;E Activities and capability</b>					
Complete targeted stocktakes of national RD&E capability	Complete Fruit Fly Capability and Capacity	December 2015	PHA	U	Complete
	Complete SPHD assessment	December 2016	PHA/SPHD	I	In progress
	Complete Northern Australia assessment	End September 2016	CSIRO	I	In progress
	Develop targeted assessments of key areas such as virology and bacteriology (mini workshop)	End December 2016	PHA, DEDJTR	U	In progress
	Develop case studies to explore cross sectoral RD&E. e.g. Fusarium and white fly vectored viruses.	December 2016	PHA + relevant stakeholders	U	In progress
Evaluate investment in emerging technologies and scope for their wider cross sector application	Stocktake of activity in platform technologies	December 2016	CSIRO, PBCRC and state jurisdictions	I	
	Demonstrate platform technologies and opportunities at annual forum	Annually	IC, PBCRC, DEDJTR and CSIRO	I	
Monitor RD&E capability and capacity of organisations with "Major" biosecurity roles	Review Major, Support and Link ratings	End June 2017	IC, PHA	U	

Key Performance Indicator	Activity	Date	Responsibility	Undertake Influence	Status
	<p>Complete reviews of sector specific strategy through a plant biosecurity RD&amp;E lens OR work with a sector strategy to include plant biosecurity reviews in their activities. Review three strategies per year from the following strategies;</p> <ul style="list-style-type: none"> <li>• Horticulture (tropical and temperate)</li> <li>• Fresh water aquatic weeds</li> <li>• Nursery and native plants</li> <li>• Floriculture</li> <li>• Viticulture</li> <li>• Sugar</li> <li>• Cotton</li> <li>• Forestry</li> <li>• Bees</li> <li>• Pastures</li> <li>• Social science</li> <li>• Grains</li> <li>• Weeds</li> </ul>	On going	Specific stakeholders to be identified for each review	U/I	
Assist sectoral strategies to identify and access RD&E capability and resources	Capability gaps in biosecurity identified in two sectoral strategies each year and develop succession plans/capability building/capability access plans as required	Annually	PHA, IC	U/I	
Identify capability for priority cross sector RD&E priorities	Capability plans developed for three priorities each year	Annually (by December)	PHA, IC	U/I	
	Review RD&E components of National Plant Biosecurity Diagnostic and Surveillance Strategies	August 2017	PHA, IC, SPHD, SNPHS	U/I	

Key Performance Indicator	Activity	Date	Responsibility	Undertake Influence	Status
<b>Engaged and Linked Stakeholders</b>					
Liaise with all relevant sector strategies	Meet with each of the relevant plant and animal strategies once per year to identify opportunities for collaboration	On going	PHA	U	In progress
Liaise with all relevant RDCs	Meet with each of the relevant plant and animal RDCs once per year to identify opportunities for collaboration	On going	PHA	U	In progress
Report to PHC	Report to PHC at each meeting on issues identified and opportunities arising	On going	PHA	U	In progress
Communication and engagement plan implemented	Communication and engagement plan developed	December 2015	PHA	U	Complete
	Communication implementation plan developed	September 2016	PHA	U	
Report to AGSOC Research and Innovation Committee	Six monthly and annual reports	6 monthly (June and December)	PHA	U	
Provide input as appropriate into external reviews	Provide a "committee" submission into plant biosecurity relevant reviews as agreed by the committee	On going	PHA, IC	U	Complete
	Provide comments of DAWR preparedness report	End March 2016	PHA, IC	U	Complete
	Contribute to the PBCRC review on a sustainable RD&E system	End July 2016	PHA, IC	U	In progress
Global Biosecurity Conference held	Conference plan developed	September 2017	IC	I	
<b>Enhance Knowledge and data management</b>					
Effective acquisition, storage and distribution of RD&E data	Gaps in information available in National Plant Biosecurity Status Report identified	January 2016	PHA	U/I	Complete

Key Performance Indicator	Activity	Date	Responsibility	Undertake Influence	Status
	Revised pro forma for National Plant Biosecurity Status Report released	February 2016	PHA	U	Complete
Improved access to and awareness of RD&E activities and outputs	New information requirements for National Plant Biosecurity Status Report associated benefits advocated widely	Jan to Mar 2016	PHA, IC	U	Complete
	National Plant Biosecurity Status Report revised to highlight new RD&E information capabilities	September 2016	PHA	U	In progress