# National Plant Biosecurity Strategy

December 2010

Plant Health Australia (PHA) is the national coordinator of the government-industry partnership for plant biosecurity in Australia. As a not-for-profit company, PHA services the needs of Members and independently advocates on behalf of the national plant biosecurity system. PHA's efforts help minimise plant pest impacts, enhance Australia's plant health status, assist trade, safeguard the livelihood of producers, support the sustainability and profitability of plant industries and the communities that rely upon them, and preserve environmental health and amenity.



Suite 5, FECCA House
4 Phipps Close
Deakin ACT 2600

Phone: 02 6215 7700
Fax: 02 6260 4321
Email: **admin@phau.com.au**

**www.planthealthaustralia.com.au**

An electronic copy of this document is available from the website listed above.

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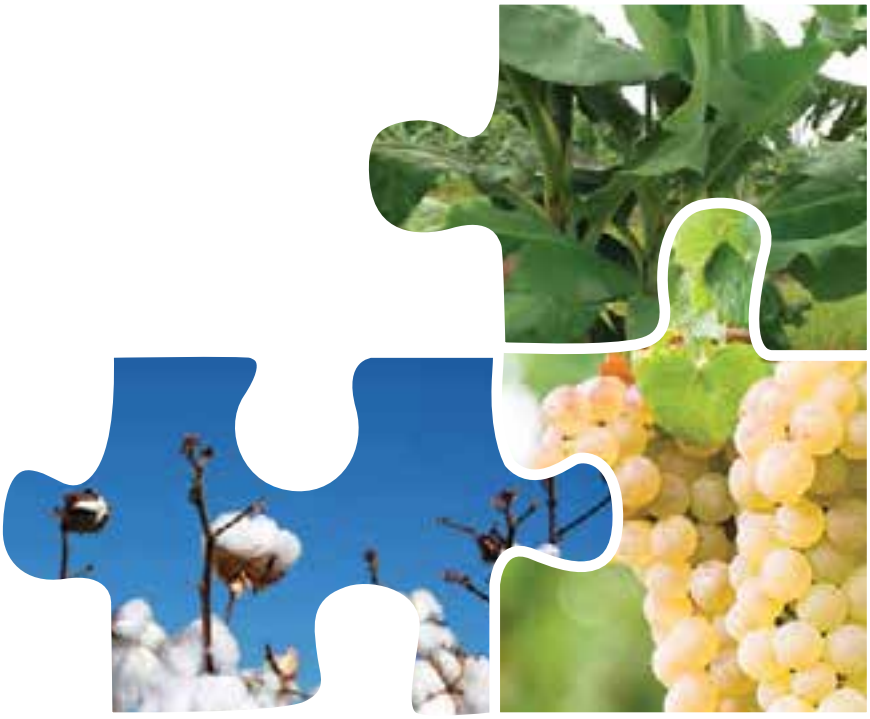

Plant Health AUSTRALIA

# The following Plant Health Australia Members endorse the National Plant Biosecurity Strategy.

## Government Members

Australian Government
Department of Agriculture, Fisheries and Forestry

Northern Territory Government

NSW Government | Industry & Investment

Queensland Government

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HAL
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## Industry Members

























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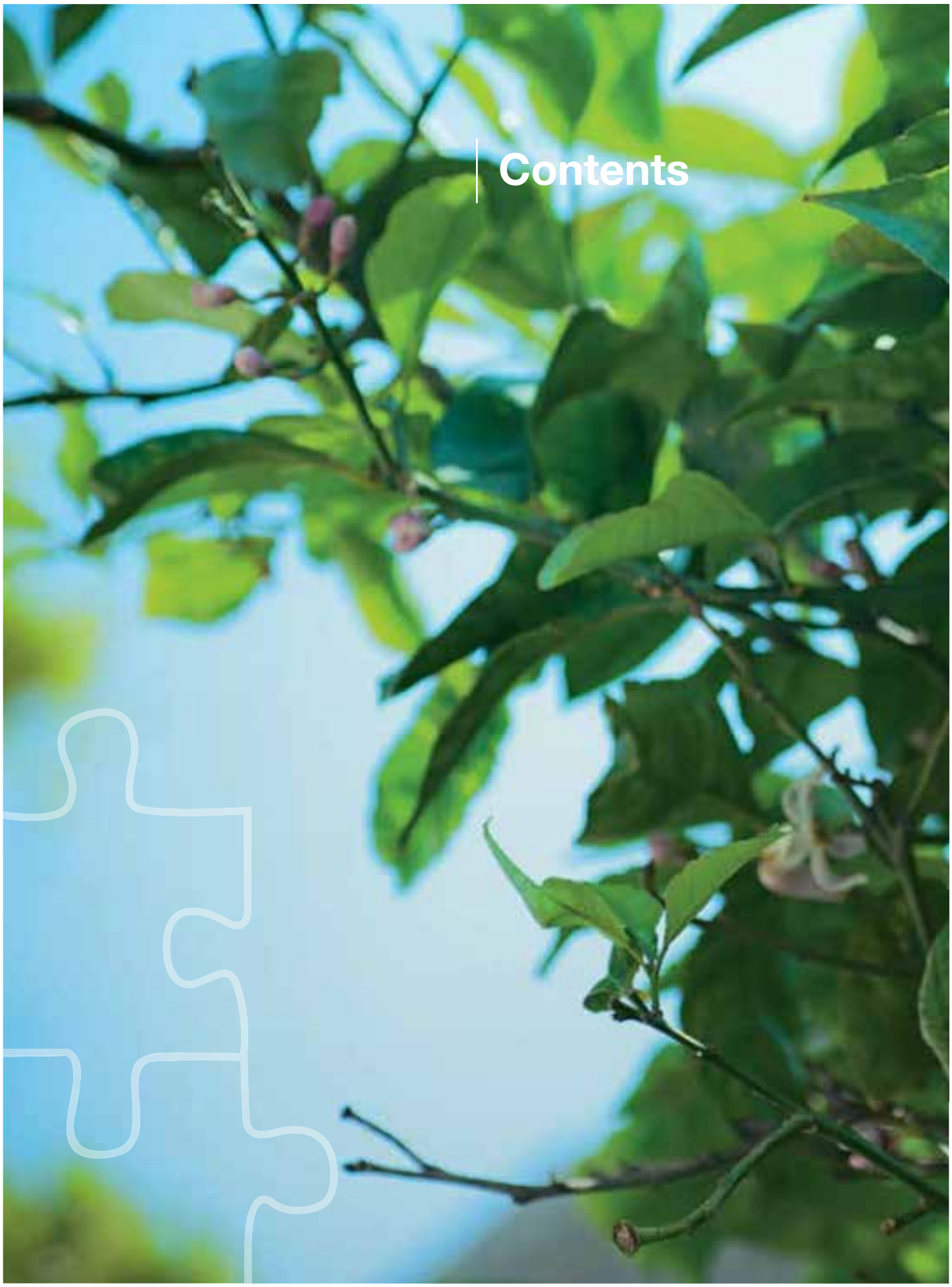

# Executive summary

## A unique opportunity has arisen to develop a strategy that will deliver a modern, dynamic and integrated national plant biosecurity system. This has been provided by the release of the Beale Review[1], and subsequent steps to reorganise Australia's plant biosecurity system and establish an Inter-Governmental Agreement on Biosecurity.

Australia has a plant production system, including agriculture and forestry, worth $25 billion annually[2,3] and a unique environment to protect. This system not only supports the livelihoods and investments of individual producers, it also protects consumers in domestic and export markets, by maintaining the integrity, quality and sustainability of Australia's food supply.

Ensuring the continued success of Australia's plant biosecurity system is not easy. It currently faces a number of substantial challenges, including a diversity of stakeholders, a need to intercept pests across 60,000 km of coastline, domestic and international regulatory and trade pressures, increasing tourism and trade as well as climate change and variability. Adding to these challenges is the need to manage human, infrastructure and financial resources within a complex mix of competing demands.

There is a recognition that the plant biosecurity system is significantly under-resourced and that if this is not addressed, it could have a significant impact on Australia's ability to manage plant pests[1].

Ensuring government and industry representatives continue to work together in partnership to refine and develop the system, to fill gaps and meet future challenges is critical. Although many components of a national system are in place and necessary initiatives are underway, to date Australia has not had a cohesive and agreed national strategy specific to plant biosecurity. Having this in place will ensure greater and continued benefits to the broader community.

Facing these challenges head on, the National Plant Biosecurity Strategy (NPBS) presents a blueprint for a strengthened national plant biosecurity system to 2020. This system needs to manage risks associated with plant pests (established and exotic) and other threats that have the potential to adversely affect plant biosecurity. The NPBS provides clear guidance to decision makers, policy creators and funding agencies as to the direction that must be taken to secure Australia's plant biosecurity future.

Ten strategies have been formulated to respond to the challenges currently facing the system. These are to:

1. Adopt nationally consistent plant biosecurity legislation, regulations and approaches where possible within each state and territory government's overarching legislative framework
2. Establish a nationally coordinated surveillance system
3. Build Australia's ability to prepare for, and respond to, pest incursions
4. Expand Australia's plant biosecurity training capacity and capability
5. Create a nationally integrated diagnostic network
6. Enhance national management systems for established pests
7. Establish an integrated national approach to plant biosecurity education and awareness
8. Develop a national framework for plant biosecurity research
9. Adopt systems and mechanisms for the efficient and effective distribution, communication and uptake of plant biosecurity information
10. Monitor the integrity of the plant biosecurity system

Each strategy is underpinned by a number of recommendations and actions, which are fully explained in this strategy.

Implementation of the NPBS will deliver an internationally first class plant biosecurity system capable of supporting sustainable plant production and environmental health while maintaining and enhancing market access.

# Summary of recommendations and actions

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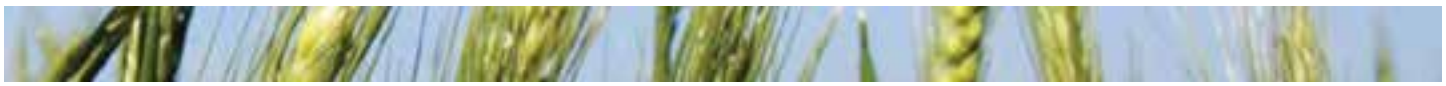
|---|---|
| **Strategy 1** | **Adopt nationally consistent plant biosecurity legislation, regulations and approaches where possible within each state and territory government's overarching legislative framework** |
| Recommendation 1 | **Establish a framework for plant biosecurity legislation that promotes harmonisation and consistency of regulation for trade in plants and plant products within Australia, in accord with the principles of domestic trade and Australia's international rights and obligations** |
| Action 1.1 | Establish an agreed, nationally consistent risk assessment method for trade in plants and plant products in accordance with International Plant Protection Convention International Standards for Phytosanitary Measures No. 2 (Framework for Pest Risk Analysis) |
| Action 1.2 | Address complex, inconsistent legislative processes and language via the development of a framework that delivers nationally consistent approaches to the biosecure trade of plants and plant products in Australia |
| Action 1.3 | Ensure that legislation and agreements are in place to meet all Emergency Plant Pest Response Deed requirements and that bilateral/multilateral arrangements are in place to remove any impediments to cross border emergency responses |
| Action 1.4 | Align domestic and international market access policy and operations to identify and capture efficiencies in their delivery through integrated export systems and processes |
| Action 1.5 | Review domestic and international phytosanitary certification processes for the movement of plants and plant products, focusing on the national adoption of electronic systems for certification by government inspectors and by businesses accredited under approved schemes |
| Action 1.6 | Develop a process for government and industry education and training on regulatory processes and obligations at national and international levels |
| Recommendation 2 | **Provide resources and appropriate processes to ensure the development and implementation of nationally consistent plant biosecurity legislation and regulations** |
| Action 2.1 | State and territory governments commit sufficient resources to implement the actions recommended under this strategy |
| **Strategy 2** | **Establish a nationally coordinated surveillance system** |
| Recommendation 3 | **Facilitate the development of a nationally coordinated and targeted surveillance system that provides intelligence, supports the early detection of exotic plant pests, reports evidence of area freedom, enhances pest incursion responses and supports the effective management of established pests** |
| Action 3.1 | Establish nationally agreed standards and plans for the collection of surveillance data for priority plant pests for the purposes of early detection and market access |
| Action 3.2 | Establish a national surveillance coordination centre with responsibility for reviewing the national design, collection, capture and analysis of data |
| Action 3.3 | Establish a mechanism to engage industry, regions and communities to ensure broader recognition of the importance of surveillance and collection of surveillance data |
| Action 3.4 | National surveillance protocols should be developed and linked with Quality Assurance systems and accreditation to act as a driver for creating capacity and capability |



| Strategy 3 | Build Australia's ability to prepare for, and respond to, pest incursions |
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| Recommendation 4 | Continue to review and improve emergency response efficiency and effectiveness through improved processes, decision making, education, training and accreditation of personnel |
| Action 4.1 | Continually review and improve joint industry and government decision making and response management arrangements to ensure they are rapid, collaborative, clear, effective, efficient and meet stakeholder expectations |
| Action 4.2 | Gain national commitment to ensure emergency response training is available, delivered at the appropriate frequency and meeting role needs |
| Action 4.3 | Increase efficiency by identifying and addressing gaps and overlaps in responsibilities of relevant national, state and territory, and regional authorities in emergency management roles |
| Action 4.4 | Develop a nationally agreed approach where eradication is technically not feasible |
| Action 4.5 | Develop forecasts of expected production by plant industries as a biosecurity risk management, preparedness and response tool |
| Action 4.6 | Stakeholders provide resources to ensure that baseline capacity is sufficient to meet normal commitments under the Emergency Plant Pest Response Deed and similar instruments, through the development of normal commitments benchmarks, performance standards and regular reporting |
| Action 4.7 | Develop pre-agreed, risk based national response and cost sharing arrangements for pests not covered by existing arrangements |
| Recommendation 5 | Develop contingency plans or business continuity plans covering all High Priority Pests |
| Action 5.1 | Develop contingency plans or business continuity plans for all identified High Priority Pests with the allocation of agreed national roles and responsibilities |
| Recommendation 6 | Develop a national risk based decision making and investment framework that guides the efficient allocation of plant biosecurity resources, maximising return on investment and establishing a transparent and objective decision making process |
| **Strategy 4** | **Expand Australia's plant biosecurity training capacity and capability** |
| Recommendation 7 | Maintain and enhance Australia's plant biosecurity training capability and capacity to underpin the ongoing needs of the national plant biosecurity system |
| Action 7.1 | Develop a national training framework (at both tertiary and vocational levels) to fill existing and anticipated future skill gaps |
| Action 7.2 | Assessment and appropriate allocation of Australian Research Council and Research & Development Corporation funding that contributes to the training of Australian scientists in plant biosecurity related disciplines |
| Action 7.3 | Link undergraduate and postgraduate scholarships to industry and government employment opportunities |
| Action 7.4 | Develop a mechanism to generate surge capacity in laboratory and operational staff in the event of an Emergency Plant Pest incursion |
| Action 7.5 | Instigate annual plant biosecurity workshops to enable professional networking and information exchange |

| Strategy 5 | Create a nationally integrated diagnostic network |
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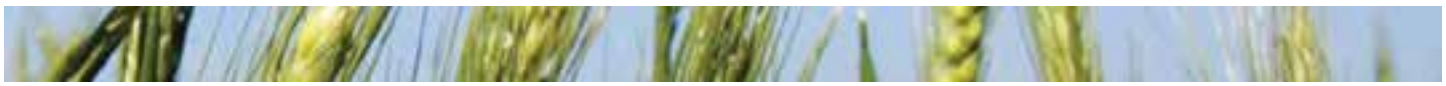
| Recommendation 8 | Develop a nationally integrated plant biosecurity diagnostic network that underpins Australia's plant biosecurity system |
| Action 8.1 | Establish a nationally integrated plant biosecurity diagnostic network |
| Action 8.2 | Establish a harmonised approval process for the transfer of suspect and confirmed samples of priority plant pests between laboratories |
| Action 8.3 | Establish an integrated and coordinated network of diagnostic centres based on Australia's climatic zones |
| Action 8.4 | Key roles and responsibilities agreed amongst agencies on a nationally coordinated basis |
| Action 8.5 | Design and develop a National Plant Biosecurity Diagnostic Strategy within the National Plant Biosecurity Strategy framework, which identifies key goals, objectives, timelines and resource requirements |
| Action 8.6 | Develop a process to encourage new diagnosticians to enter the field and enable continued professional development of current diagnosticians |
| Recommendation 9 | Implement, maintain and manage appropriate quality management systems in plant biosecurity laboratories undertaking diagnostic testing |
| Action 9.1 | Develop a network of plant biosecurity diagnostic laboratories that have the ability to deliver diagnostic testing to the quality required by the customer |
| Action 9.2 | Governments to take responsibility for establishment and ongoing costs of maintaining appropriate quality systems for diagnostic laboratories |
| Recommendation 10 | Endorsed National Diagnostic Protocols for all High Priority Pests be developed and maintained |
| Action 10.1 | Regularly prioritise diagnostic protocols for development and review using a contemporary risk based approach |
| Action 10.2 | Develop a national policy to facilitate access to reference material and positive controls for diagnostic tests by ensuring appropriate processes and containment protocols are in place for their importation, storage and handling |
| **Strategy 6** | **Enhance national management systems for established pests** |
| Recommendation 11 | Enhance the national management system for established pests |
| Action 11.1 | Develop a nationally integrated approach for management of significant established pests that consolidates information into national data sets |
| Action 11.2 | Establish systems to accurately determine the cost of pest management operations and guide the effective allocation of resources |
| Action 11.3 | Develop national decision making support tools that can assess the likely spread and impact of established species and determine shifts in pest risk profiles |
| Action 11.4 | Integrated Pest Management should be encouraged where applicable as the baseline for established pest management operations |
| Action 11.5 | Promote and facilitate active development and introduction of new plant varieties using both traditional breeding and other plant biotechnology techniques (including genetic modification), where consistent with state and territory legislation, that are resistant to pest attack and better adapted to regions subject to climate change and variability |



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| **Strategy 7** | **Establish an integrated national approach to plant biosecurity education and awareness** |
| Recommendation 12 | Develop an integrated national approach to plant biosecurity communication between all key stakeholders |
| Action 12.1 | Use Industry Biosecurity Plans and other relevant documents as a base to establish and develop specific sectoral awareness packages |
| Action 12.2 | When developing plant biosecurity operational and extension plans, ensure specific stakeholder needs are taken into account |
| Action 12.3 | Through the National Communications Network develop a National Biosecurity Communication Strategy |
| Recommendation 13 | Processes need to be defined that identify, engage, evaluate and sustain community engagement and capture plant biosecurity information |
| Action 13.1 | Community engagement strategies should be supported with infrastructure that enables feedback and follow up to be provided to community participants, delivering wider community engagement and valuable plant biosecurity information |
| Action 13.2 | Develop processes that support the identification and characterisation of small and large agricultural enterprises in Australia |
| **Strategy 8** | **Develop a national framework for plant biosecurity research** |
| Recommendation 14 | Establish a national framework for plant biosecurity research |
| Action 14.1 | Conduct a national plant industries research and development stocktake on a regular basis |
| Action 14.2 | Identify and prioritise key research and development areas in plant biosecurity |
| **Strategy 9** | **Adopt systems and mechanisms for the efficient and effective distribution, communication and uptake of plant biosecurity information** |
| Recommendation 15 | Establish a national plant biosecurity information management framework to optimise data sharing |
| Action 15.1 | Develop, implement and maintain standardised information systems nationally, both within government and industry, for the collection, analysis and retrieval of surveillance data |
| Action 15.2 | Develop a system that enables the sharing of diagnostic data nationally and complete a stocktake of existing data management systems in plant biosecurity laboratories |
| Action 15.3 | Develop systems and strategies for efficient storage, effective distribution and uptake of research and development outcomes |
| Action 15.4 | Ensure that existing data systems of relevance to plant biosecurity are linked to future systems |
| **Strategy 10** | **Monitor the integrity of the plant biosecurity system** |
| Recommendation 16 | Monitor the integrity of the plant biosecurity system in conjunction with, and on behalf of, all stakeholders, through Plant Health Australia |
| Recommendation 17 | Develop an implementation plan for the delivery of the National Plant Biosecurity Strategy in conjunction with, and on behalf of, all stakeholders, through Plant Health Australia |
| Action 17.1 | A National Plant Biosecurity Strategy Implementation Committee be established to develop an action plan that can direct the implementation of the National Plant Biosecurity Strategy in accordance with the recommendations and actions presented within the strategy |

# Introduction

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

Plant pests are living organisms that have the potential to adversely affect food, fibre, ornamental crops and stored products, as well as environmental flora and fauna. Plant pests include insects, mites, pathogens, nematodes, snails and weeds. For agricultural systems, if pests are left unmanaged they can reduce crop yields, significantly increase costs and in the worst case scenario, bring about the complete failure of a production system. Historical examples present us with a graphic picture of the serious impact that harmful organisms can have on agricultural production and as a consequence, human life[4].

As an island continent, Australia's geographic isolation has meant that the country is relatively free from many of the pests that significantly impact plant industries overseas. As a major producer and exporter of plants and plant products, Australia places a high priority on the maintenance of plant biosecurity and has developed a sophisticated system in which government and industry share the responsibility as well as the benefits. The national plant biosecurity system underpins the viability and sustainability of Australia's food, fibre and ornamental product supply. An effective national plant biosecurity system is also vital to retain and enhance existing trade opportunities and to enable access to new markets.

Australian plant industries, which include agriculture, horticulture, forestry and amenity plants and plant products have been estimated to contribute in excess of $25 billion to Australia's Gross Domestic Product (GDP) annually[2,3], which represents roughly 2.5 percent of the total contributed by Australia's industries.Over half of this agricultural produce is exported. As a result, Australia's plant industries have a strong reliance on cost effective access to international markets to remain profitable and viable.

The significant direct economic impact of pests on production occurs through reduced yields and reduced quality of produce and increased costs. It is estimated that introduced invertebrates cost over $4.7 billion in agricultural production losses annually and a further $750 million in control costs. The total cost of the impact of weeds on agriculture is estimated to be $4.5 billion annually, with some $1.7 billion spent each year on mitigation activities such as cultivation and herbicide application[5]. These figures represent a significant and growing burden on farm businesses, regional economies and the nation.

The National Plant Biosecurity Strategy (NPBS) has been developed through extensive stakeholder consultation to address the significant challenges facing Australia's plant biosecurity system.

This edition has been developed in light of the findings of the Beale Review "One Biosecurity: A Working Partnership[1]" and with recognition of the current development of the Inter-Governmental Agreement on Biosecurity (IGAB).

The NPBS presents a vision for the plant biosecurity sector where:

- Access to a national risk based decision making and investment framework guides the efficient allocation of plant biosecurity resources and maximises return on investment
- Field personnel routinely provide surveillance data to a national coordination centre
- Incentives facilitate the collation and analysis of passive surveillance information from the community
- Rapid and accurate diagnoses of potential pests is carried out using a sophisticated nationally integrated diagnostic network
- Responses to pest emergencies are timely, effective and well coordinated
- Harmonised national legislation minimises compliance costs and disruption to trade whilst ensuring effective risk mitigation

- Decision making support tools are routinely used for assessing the likely spread and impact of pests
- Pest data and management options are efficiently and securely shared between governments and organisations, supported by a nationally consistent plant biosecurity legislative framework
- Coherent communication among all key stakeholders and the wider community occurs through a nationally coordinated system
- An integrated national approach to the prioritisation of national plant biosecurity research initiatives delivers effective regional development and extension outcomes
- There are adequate and stable funding arrangements for plant biosecurity research
- The integrity of the Australian plant biosecurity system is continuously monitored for the benefit of all stakeholders

*Image courtesy of PHA*

# Legislative and policy background

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## The Beale Review

In 2008, the Australian Government initiated a major review of Australia's biosecurity system, resulting in the release of the report "One Biosecurity: A Working Partnership" also known as the Beale Review[1]. The Beale Review established that although Australia had a "good biosecurity system", it was "far from perfect". It noted that since 1996 when the last review was released (the Nairn Report[6]), there had been deterioration in cooperative biosecurity arrangements between some stakeholders.

The Beale Review states there is a requirement for a new approach that provides:

- A common understanding between the Australian Government, state and territory governments, business and the community of their respective roles and responsibilities and how these will be met
- A legal framework that can underpin a genuinely national approach for managing responses to exotic pests
- A framework to underpin a more effective approach to risk analysis, including assessment and management (monitoring, surveillance and response) of established pests
- The institutions, protocols, information systems, programs, research, and resources (funding and skills) necessary to achieve these objectives

The Australian Government's preliminary response to the Beale Review was released on 18 December 2008, agreeing in-principle to all of the Review Panel's 84 recommendations. The reform process will take some time and existing systems will continue to operate until the new arrangements are in place.

In 2010, key activities underway to improve Australia's biosecurity system included:

- Development of the IGAB between the Australian Government and state and territory governments to implement a working partnership under the new arrangements
- Development of new federal biosecurity legislation to replace the *Quarantine Act 1908* and other subordinate legislation
- Commencement of a number of interim measures within the Australian Government as a first step towards the introduction of new national biosecurity arrangements. Measures achieved so far include the appointment of an interim Inspector General of Biosecurity, the establishment of a Biosecurity Advisory Council and the consolidation of biosecurity functions across the Department of Agriculture, Fisheries and Forestry (DAFF) into the Biosecurity Services Group (BSG)

The Beale Review recommendations (and subsequent actions) have been taken into account in developing the NPBS. In a number of cases, adoption of the NPBS will give effect to the recommendations contained within the Beale Review.

## Inter-Governmental Agreement on Biosecurity

As part of its response to the Beale Review, the Australian Government, with the support of a working group of primary industry officials from each state and territory, has developed the IGAB. The agreement aims to strengthen the working partnership between governments, broadly identifies their roles and responsibilities and outlines the priority areas for collaborative effort to improve the national biosecurity system.

The IGAB covers specific recommendations in the Beale Review and provides a mechanism to progress them. It includes the development of a national priority pest list and increased Australian Government involvement in post-border monitoring and surveillance. Key aspects of the national biosecurity system addressed in the IGAB include:

- Decision making and investment frameworks
- Information sharing
- Monitoring, surveillance and diagnostics
- Arrangements for established pests

- Preparedness and response arrangements
- Research and development

The NPBS has been developed recognising IGAB and its principles.

## Emergency response agreements

Australia has a number of agreements in place that formalise response arrangements to exotic pests. Of greatest importance to plant industries is the Emergency Plant Pest Response Deed (EPPRD)[7], a formal, legally binding agreement between Plant Health Australia (PHA), the Australian Government, all state and territory governments and national plant industry representative body signatories. The EPPRD covers the management and funding of responses to Emergency Plant Pest (EPP) incidents, including the potential for Owner Reimbursement Costs (ORCs) for producers. It also formalises the role plant industries play in decision making as well as their contribution towards the costs related to EPP responses. The Emergency Animal Disease Response Agreement (EADRA)[8] is the equivalent formal agreement for animal industries.

In addition to the EPPRD and the EADRA, the National Environmental Biosecurity Response Agreement (NEBRA)[9] covers responses to nationally significant biosecurity incidents where there are predominantly public benefits or where the incident is not covered under other currently existing arrangements. It was endorsed by the Primary Industries Ministerial Council (PIMC) on 23 April 2010 as the first deliverable under the IGAB.

The NPBS recognises the role of the EPPRD and where applicable, the role of the NEBRA in the plant biosecurity system.

## Australian Weeds Strategy

The Australian Weeds Strategy (AWS)[10] provides a framework to establish consistent guidance for all parties and identifies priorities for weed management to minimise the impact of weeds on Australia's environmental, economic and social assets. It was endorsed by the Natural Resource Management Ministerial Council (NRMMC) in November 2006. The strategy has three key goals:

- Prevent new weed problems
- Reduce the impact of existing priority weed problems
- Enhance Australia's capacity and commitment to solve weed problems

The NPBS recognises and builds on the goals and strategic actions presented in the AWS. The NPBS encompasses many of the principles that form the basis of the AWS, such as shared responsibility, science based management and decision making, prevention and early detection.

## Scope of the National Plant Biosecurity Strategy

The NPBS addresses challenges and threats posed by plant pests to Australia's food security and primary production, and has been developed in alignment with Australia's state government biosecurity strategies. The strategy covers pests of agriculture, horticulture, forestry and amenity plants and plant products. Achieving the aims of the NPBS will make a significant contribution to delivering the improvements to Australia's plant biosecurity systems and performance called for in the Beale Review.

The scope of the NPBS covers the national response to exotic plant pest incursions as well as the containment and management of established plant pests by government, industry and other affected stakeholders. It also covers Emergency Weeds.

The NPBS recognises that pests of significant environmental concern are covered under the NEBRA and that weeds are managed more directly under the AWS. The NPBS does not cover the undesirable economic, environmental and social impacts of terrestrial vertebrate animals (such as mammals, birds, reptiles, amphibians and fish), which are addressed in the Australian Pest Animal Strategy (APAS)[11].

# Issues and challenges

# Issues and challenges

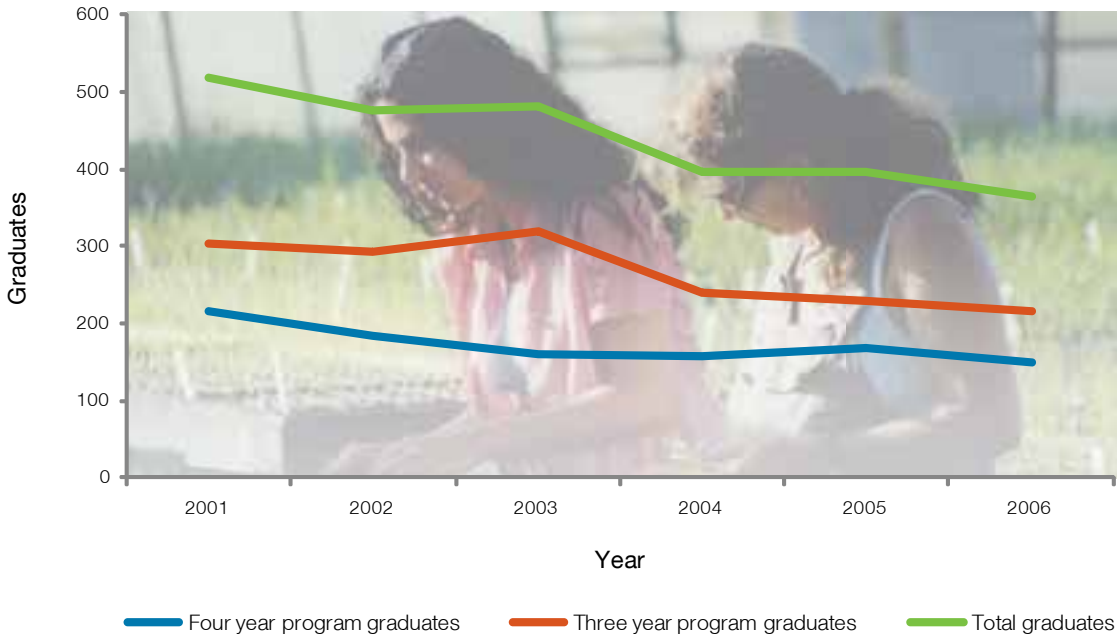
## Through wide consultation and analysis of a number of recent studies, key issues and important common themes that underpin the NPBS have been identified.

### (a) Human resources in decline

Whilst there continues to be a commendable depth of expertise throughout the plant biosecurity system, some areas are beginning to experience shortages of people with appropriate plant biosecurity skills and knowledge. This is compounded by the current difficulties in attracting and retaining people to the agricultural sector.

A number of recent studies have identified these emerging trends. Work undertaken by the Australian Council of Deans of Agriculture (ACDA)[12] indicates a continuing fall in Australian graduates from university agricultural programs (see Figure 1). Futhermore, estimated demand already exceeds the current supply of agricultural graduates by a factor of three.

Figure 1: Numbers of graduates from university agricultural programs 2001–2006[12]




Further work undertaken by Howie[13] within the plant pathology and entomology disciplines demonstrated that whilst a relatively even spread of expertise currently exists across all age brackets, almost 50 percent of respondents indicated they were likely to leave employment in these disciplines within ten years. The factors driving this loss of expertise included retirement, a desire to change career and concern about job security, highlighting dissatisfaction with current terms of employment across the sector.

Whilst the number of staff linked to diagnostic work had increased since 1995, the time spent directly on diagnostic work had decreased[14]. This is likely to reflect the increasing reliance on third party research grants to support staff (and therefore the diagnostic resource) as internal funds are cut back.

Due to a combination of retirement, higher rates of attrition, inadequate numbers of skilled professionals entering the system and reduced commitments to key technical areas, the plant biosecurity sector can expect to see a substantial decline in human resources and core capabilities over the next 20 years. Continuing on current trends, the Commonwealth Scientific Industrial Research Organisation (CSIRO) estimates 50 percent of Australia's biosecurity diagnostic expertise will be lost by 2028[15].

These issues are further compounded by the general lack of succession planning currently evident in the organisations that provide technical and operational support for plant biosecurity in Australia. A system that provides succession planning and the transfer of knowledge from experienced practitioners to new graduates, in addition to clear career paths for future experts, is required.

Australia's emergency response capacity is drawn almost entirely from 'normal' day-to-day resources that exist primarily to deliver routine functions of pest management, quarantine services, response planning, information and communication services or research and development. Thus, long term plant quarantine incidents have the potential to significantly impact not only directly on industries and communities, but also the fundamental plant biosecurity systems.

*Image courtesy of Summerfruit Australia*

# Issues and challenges *continued*

## (b) A constantly changing environment

Climate change and variability are clearly recognised as a major threats to agricultural systems. Over the coming decades Australia is expected to experience increases in average temperatures and see daily temperature extremes producing more hot days (above 35°C) over summer and fewer cold days (below 0°C) in winter. Climate change and variability will also impact on average rainfall patterns and increase the frequency of extreme weather events[16].

Such changes are likely to affect crop/pest interactions. However, the extent to which climate change and variability will affect most pests and their hosts is not yet clearly understood.

Pest outbreaks occur when changes in climatic conditions such as temperature and moisture are most favourable for pest growth, survival and dispersal. Changes in climatic conditions can result in a pest expanding beyond its normal range into a new environment, extending losses and affecting natural plant communities[17]. This has been demonstrated by a southerly shift in the geographical range of some pests during the last century.

A predictive study of the potential distribution of Citrus canker (*Xanthomonas citri* subsp. *citri*) should it enter and become established in Australia under current and projected climatic conditions, has demonstrated that with increasing temperatures there would be a significant shift in distribution patterns and an increase in the total area potentially affected by the pest (Figure 2)[18].

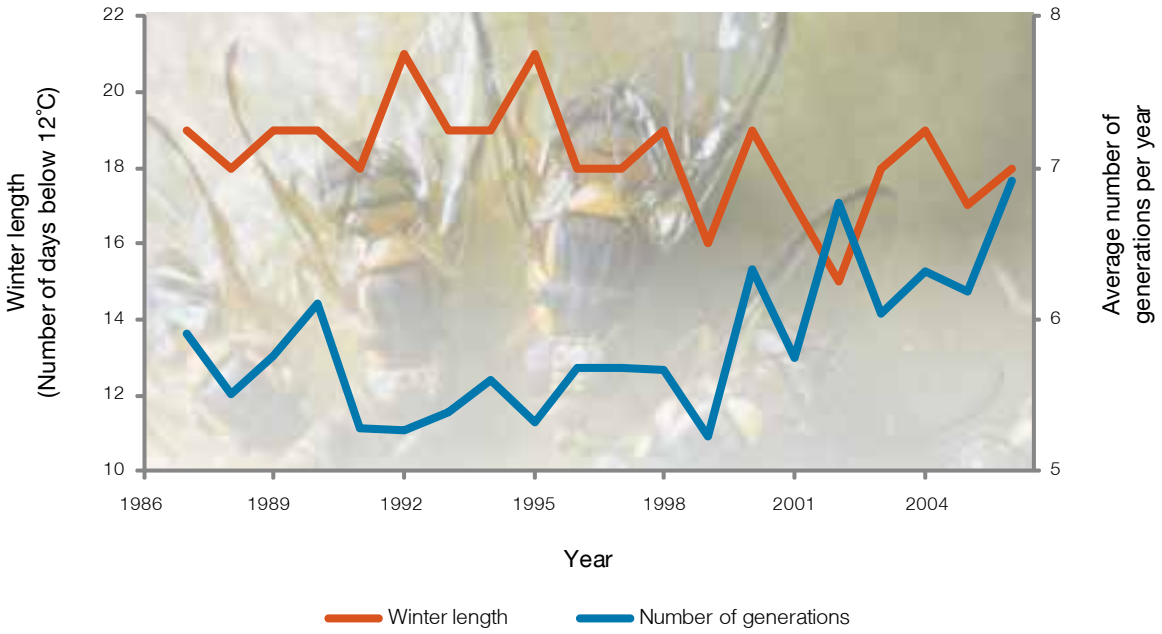
Figure 2: Predicted potential distribution of Citrus canker in Australia with increasing average temperatures[18]

*Potential distribution of Citrus canker based on average temperatures for 2006*

*Potential distribution of Citrus canker with a 3°C increase in average temperatures predicted for 2070*

Similarly, a recent preliminary analysis showed that climatic conditions in central NSW could become more favourable for the spread and reproduction of fruit flies with climate change. Increasing temperatures, decreases in cold stress and milder winters would create more favourable overwintering conditions and a subsequent increase in the number of fruit fly generations that could occur each year (Figure 3)[19].

Figure 3: Effect of winter length on the number of fruit fly generations per year[19]




## (c) Conflicting priorities for resources and funding

Australia's primary production sector exists in a dynamic, ever changing environment. Pressures placed on plant industries can generate the need to constantly shift the priorities of the plant biosecurity system, while others directly compete for its resources.

Whilst climate change and variabilty has significant future ramifications, Australian producers are also currently facing other challenges such as those associated with access to water and globalisation. These challenges not only influence the dynamics of pest management by causing a shift in production areas and pest distribution, but also directly compete for limited industry, government and private sector resources.

The plant biosecurity sector is currently significantly under-resourced. For example, The Beale Review concluded that at the Commonwealth level alone, a funding increase of $260 million per annum was required to implement the review's findings[1].

There is increasing pressure on government and industry to fund activities relevant to their sphere of operation. Agricultural funding is under pressure as all governments determine priority spending allocations for areas such as education, health and infrastructure in response to changes in human demographics and evolving policy areas such as climate change, water resources and environmental protection.

There has been a steady decline in the use of public funds for Australian agricultural research, development and extension and the private sector has not been able to adequately fill this void. In 1995 the state governments provided 53 percent of agricultural research and development services and the Australian Government 22 percent. By 2007 this had fallen to 38 and 17 percent respectively[20], with little coordinated input from the private sector to ensure efficient and targeted provision of resources.

Sharing the cost of plant biosecurity programs, where there are both public and private beneficiaries, is an important issue. This is increasingly becoming an expectation of governments, where beneficiaries are being asked to contribute to funding the implementation of traditionally public funded programs.

Compounding this problem is the ever increasing cost to producers of complying with domestic and international market access requirements, as well as funding the research and development required to maintain or enhance these activities.

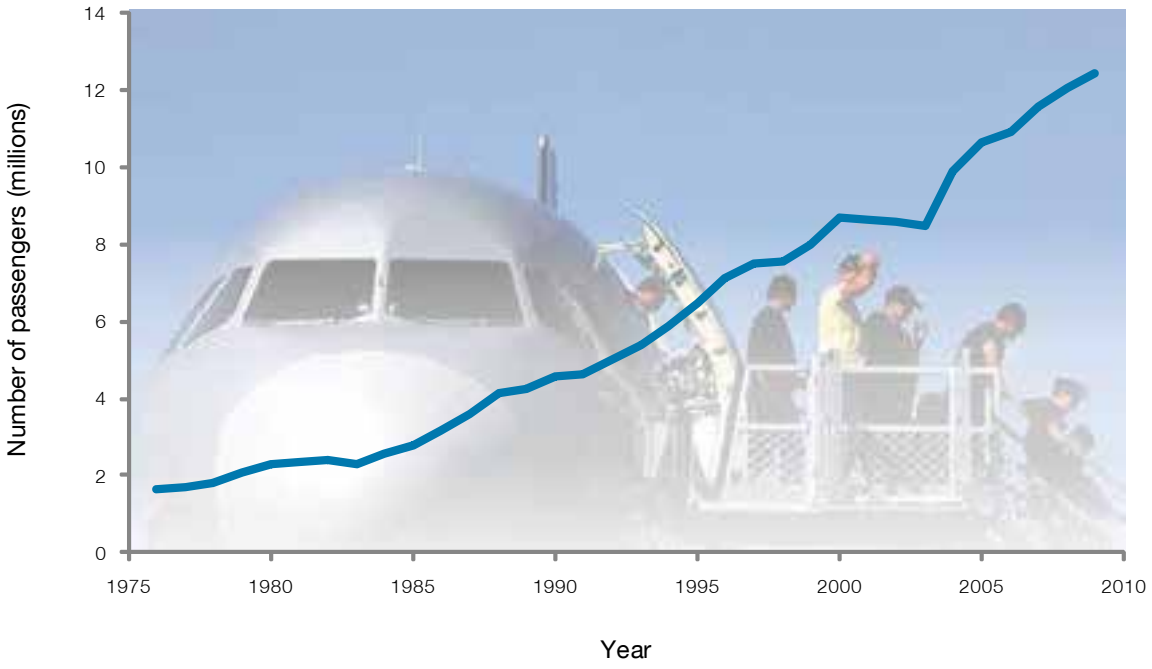
Finally, for producers, biosecurity in times of financial stress and low productivity can often be regarded as a secondary issue. If there is no immediate threat or experience of loss, the implementation of biosecurity activities can be regarded as "optional insurance" or something that can be dealt with at a later date.

### (d) International movement of produce and people

With ever increasing and more rapid movement of people and produce across state and national borders, the nation's plant biosecurity status is constantly being tested.

The number of travellers entering Australia each year is increasing (Figure 4)[21]. These travellers and the aircraft and ships in which they travel are potential carriers of pests into Australia. This rate of people and produce movement growth is forecast to continue over the next ten years[1]. The risk of introduction of pests is greater when trade vessels with more than 1.8 million containers of cargo and the 150 million mail items arriving in Australia annually are considered[22].

Figure 4: Passenger arrivals to Australia[21]




In keeping with the pace of globalisation, the range of countries from which travellers enter Australia and the frequency with which they arrive from particular regions is also increasing. This is expanding the potential pathways of entry for pests of concern.

The number and geographic dispersion of Australia's ports, particularly seaports, also poses logistical and resourcing challenges for border biosecurity. In acknowledgement of this, and in acceptance of Australia's Appropriate Level Of Protection (ALOP) being set at "very low risk", the Beale Review recommended that Australia move away from mandated border inspection targets and instead move towards risk based inspection regimes.

Mitigating the risk of pest entry is made more difficult by variations in the processes used for the assessment of risk across Australia's various states and territories. Whilst all are scientifically based, differences in processes combined with differences in legislation and regulations have increased the complexity and cost of compliance.

### (e) Loss of crop protection products

The range of registered agricultural chemicals available to agricultural producers for the control of pests is subject to change. In many cases, specific products (e.g. disinfestation products including fumigants, post-harvest dips and flood sprays) might become unavailable. In some cases, alternative crop protection products or methods are either not available, are significantly more costly or require substantial new investment in development and infrastructure to achieve the desired outcome.

For example, the Australian Pesticides and Veterinary Medicines Authority (APVMA) is currently reviewing the use patterns of the insecticides dimethoate and fenthion. These products are used in the management of fruit flies in Australia and facilitate the domestic and international trade of a range of horticultural commodities. The current value of interstate and international trade using these products is estimated to be more than $360 million per annum. If the outcomes of the review result in a change to current use patterns of these products, then access to domestic and international markets could be hindered and costs along the supply chain where alternative measures are required could significantly increase.

This issue poses significant challenges to pest management operations and usually necessitates shifts in how control operations are conducted. In some cases, this may dictate whether certain control strategies can be sustained.

### (f) Research and development coordination, collaboration and capacity

The current agricultural research and development framework was put in place over 20 years ago where industry funds are matched with Australian Government funding through some 15 commodity centred Research and Development Corporations (RDCs). This system has lead to substantial gains in agricultural productivity and sustainability. Results from an analysis of 59 randomly selected programs in 2009 found that there was a substantial return on investment with a benefit/cost ratio of 2.36 after five years and 5.56 after ten years. The return rises to 10.51 after 25 years. That is, for every $1.00 invested, $10.51 is returned after 25 years[23].

Funding for research under this system has been divided along industry lines, and cross sectoral issues, such as water and biosecurity, have struggled to achieve the scope and collaboration required[24]. This division has made the national prioritisation and coordination of multi-discipline projects complex and difficult.

These issues are reflected in the plant biosecurity sector, where information and knowledge gaps remain and coordination of expertise and resources has been difficult due to the broad range of stakeholders involved. Ongoing development of surveillance, market access, diagnostics, in-field pest management techniques, refinement of systems approaches, and alternative post-harvest treatments, are some of the areas where broader collaboration is required.

### (g) Engaging all commodity groups and the wider community

In many situations producers and communities, especially in urban and peri-urban areas, are best placed to detect a pest incursion soon after its arrival. The chances of containing and successfully eradicating a pest significantly increase with early detection, so producers and the wider community play a critical role in Australia's biosecurity system. Engaging the community in biosecurity matters is therefore an important role for governments and industry.

It has been recognised that there has been a large reduction in the network of government agricultural extension officers. This reduction has lead to the closure of many regional government offices and a loss of expertise in agricultural and horticultural crop agronomy and plant protection. While there has been growth in the numbers of private crop consultants, the nature of their roles may limit their ability to devote time to activities such as plant biosecurity education.

# Issues and challenges *continued*

A recent review of the programs run by government and industry aimed at engaging community stakeholders on biosecurity issues has identified an number of shortcomings[25]. These include a lack of:

- Coordination of biosecurity engagement activities
- Effective collaboration and networking between government, industry and community groups
- Trust between stakeholders at all levels, from government down to individuals
- Inclusion of various stakeholders in engagement processes and practices
- Identification of target groups
- Two-way communication
- Relevant messages and activities aligned with community needs, including appropriate communication of scientific knowledge to non-experts
- Communication on pests and diseases that are difficult to identify
- Face-to-face communication between biosecurity agencies and communities
- Monitoring, feedback and evaluation of programs

Whilst the review also identified many of the successful aspects of current programs, it highlighted that the current emphasis on top down communication is less effective in generating lasting change than collaborative or participatory approaches.

There is also a need to identify target groups and develop biosecurity messages tailored to these groups. This is an important point considering the diversification of Australia's agricultural production systems, both in a production and cultural sense. This is also significant when the increasing number of urban and peri-urban producers who physically move or change their farming practices every few years, and tend not to be represented by peak bodies, are considered.

Itinerant backpackers and travellers who follow the National Harvest Trail from Victoria to Queensland, are also an important target group. This group can potentially transport pests between production areas and therefore must be engaged in Australia's plant biosecurity system.

## (h) International market access

Market access issues have become increasingly important over the last ten years, as many developing countries join the World Trade Organisation (WTO). All WTO countries are required to manage their imports under the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement)[26]. In many cases, this has lead to Australia's trading partners introducing or upgrading quarantine requirements, which has in turn necessitated greater regulatory control and posed a threat to existing agricultural markets. As the demand for scientific data to support trade grows, it is placing increasing strain on Australia's ability to gain and maintain market access.

To continue to profit from the opportunities that exist offshore, Australia must not only demonstrate to international trading partners that it can export produce free of pests, but also that many of the economically significant pests that adversely affect agriculture elsewhere are not present in Australia. Ongoing work is required to ensure that markets for Australian produce are maintained and developed, in an increasingly competitive global trading environment.

## (i) Uncoordinated plant biosecurity policy

While agricultural pests do not recognise state borders, their management is generally undertaken at the state and territory level. It is recognised that state based control programs are tailored to meet specific regional requirements and risk profiles. However, when state legislation is not harmonised, significant inefficiencies, unnecessary procedures and costs, and delays in product movement across borders can develop.

For many Australian producers, the domestic market is just as important as the export market. Given Australia's geographic diversity, many states and territories have different domestic regulations in place to protect their producers from pests not present in their region. For example, cold treatment is widely recognised internationally as a risk management measure for a number of insect pests of horticulture. Industries have completed cold treatment trials at increased temperatures for different commodities, to provide some flexibility in shipping times and temperatures and the Australian Government has actively pursued acceptance of these elevated temperatures with international trading partners. States and territories however, have sometimes been slow to adopt and endorse these elevated treatment temperatures. This in turn has the potential to impact on international market access negotiations as trading partners may question why they should accept conditions not agreed to across Australia.

Ensuring domestic regulations are in place to maintain area freedom improves market access for producers, at both domestic and international levels. These domestic arrangements need to be consistent with the WTO and are part of a tiered approach to managing pests.

Independent evaluation systems applied by all state and territory governments under their own legislation accommodate state sovereign rights. These can undermine the national approach and lead to inconsistent applications of Australia's ALOP, at least for short periods, with these variations being highlighted by our trading partners. They may also impose additional costs to industry seeking to move commodities between states and territories and have triggered calls from industry for increased harmonisation of interstate regulation.

*Image courtesy of DAFF*

# Strategies

# Strategies

**The following section presents strategies, recommendations and actions for achieving an internationally outstanding plant biosecurity system capable of supporting sustainable plant production and environmental health while maintaining and enhancing market access.**

## Strategy 1 | Adopt nationally consistent plant biosecurity legislation, regulations and approaches where possible within each state and territory government's overarching legislative framework

| Limitations of the current system | Vision for 2020 |
|---|---|
| • Non-coordinated state and territory based legislation | • A framework for plant biosecurity legislation that promotes harmonisation and consistency of regulation for trade in plants and plant products within Australia, that is consistent with the principles of domestic trade and Australia's international rights and obligations<br>• Resources and appropriate processes in place to ensure the development of nationally consistent plant biosecurity legislation and regulations |
| • Variations in frameworks used to develop legislation and regulations often lead to inconsistencies across state and territory governments and result in increased costs to producers, reduced competitiveness and potential confusion in market access negotiations | • An agreed nationally consistent risk assessment method for trade in plants and plant products consistent with International Plant Protection Convention International Standards for Phytosanitary Measures (IPPC ISPM) No. 2 (Framework for Pest Risk Analysis)[27]. A process in place for government and industry education on regulatory processes and obligations at national and international levels |
| • Current certification methods for domestic quarantine are based on paper systems | • A national electronic certification system for supporting interstate trade and which facilitates the prevention of assisted movement of pests into areas previously free of them |

Regulatory measures are necessary to ensure that pests are not spread either domestically or internationally, and if they are, that their impacts are mitigated.

As a member of the WTO, and a signatory to the SPS Agreement, Australia is committed to the principles and obligations of the SPS Agreement. This obligation extends to all state and territory governments through the Memorandum of Understanding (MoU) on Animal and Plant Quarantine Measures. The MoU was agreed by all Australian governments in December 1995 to enable compliance by Australia with obligations under the SPS Agreement. This MoU has been superseded by the IGAB.

Under the Australian Constitution, legal frameworks co-exist at a national and state/territory level. This recognises the sovereign rights of the Australian Government, and state and territory governments. These legal and regulatory frameworks provide the mechanisms through which plant biosecurity programs are delivered. The complex nature of these frameworks means that the connectivity and cooperation between all levels of government is vital to managing plant biosecurity across the contemporary biosecurity continuum, from pre-border locations to farms and local communities.

It is required that each state and territory's legislation:

- Supports Australian Government legislation
- Delivers nationally consistent outcomes
- Meets international standards and does not jeopardise overseas market access or Australia's international treaty obligations
- Facilitates the movement of plants and plant products across state and territory borders, while still maintaining "pest free areas" where there are market access advantages in doing so

If legislation and regulations are not consistent then inefficiencies and costs can increase. For example, not all Australian states impose the same suspension zone around outbreaks of Queensland fruit fly (*Bactrocera tryoni*) detections. This lack of national consistency in approach to pest risk reviews and the application of the ALOP has been noted by other countries and has lead to difficulties in international market access negotiations.

**Recommendation 1:**

**Establish a framework for plant biosecurity legislation that promotes harmonisation and consistency of regulation for trade in plants and plant products within Australia, in accord with the principles of domestic trade and Australia's international rights and obligations**

***Action 1.1*** *Establish an agreed, nationally consistent risk assessment method for trade in plants and plant products in accordance with IPPC ISPM No. 2 (Framework for Pest Risk Analysis)[27]**

The establishment of a single, nationally accepted risk assessment process upon which all national and state and territory plant biosecurity regulations are based is vital to ensure there is a consistent, scientifically sound, transparent process for the assessment of risk.

Although this recommendation promotes a consistent process for the assessment of risk, it also recognises there are a wide range of factors which contribute to variations in regulations, including differences in regional risk profiles.

Such a process will create equivalency between legal and regulatory frameworks of state and territory governments and reduce compliance costs by minimising variations in treatment and management practices for domestic and international markets. It will also promote understanding of why, on a risk basis, laws are consistent.

*See also Recommendation 6

*Images courtesy of PHA*

# Strategies *continued*

### *Action 1.2* *Address complex, inconsistent legislative processes and language via the development of a framework that delivers nationally consistent approaches to the biosecure trade of plants and plant products in Australia*

Variations in the frameworks used to develop legislation and regulations often lead to inconsistencies between states and territories, and result in increased compliance costs for producers, reduced competitiveness and potential confusion in market access negotiations. It is therefore recommended that a national framework be developed to guide state and territory governments in their development of plant biosecurity legislation and regulations. This will ensure legislative and regulatory measures are harmonised both with international standards and across Australia.

It is recognised that legislative processes and language are subject to each state and territory government's established Parliamentary processes and drafting practices, however the process should:

- Be based on a nationally consistent risk assessment method
- Use the least restrictive measures available
- Be necessary, non-discriminatory, transparent and technically justified
- Result in minimal impediment to the movement of people, commodities and conveyances
- Be a system that allows for quick and effective responses

A review of the legislative and regulatory drafting process is required to address the following issues:

- Inadequate coverage of technical, operational and state and territory issues
- Unrealistic operational and technical requirements
- A lack of alignment between regulations and research, and results and outcomes
- Negative lobbying resulting in 'knee-jerk' changes in directives
- A lack of understanding of the issues by parties involved in the approval process
- Difficulties associated with the application and adoption of directives by end-users

The benefits of a consistent national framework to guide state and territory governments will extend to all areas of plant biosecurity which rely on legislation or subordinate regulations. For example, emergency capability (a legal requirement under the EPPRD) will benefit from enhanced consistency in the event of an incursion.

### *Action 1.3* *Ensure that legislation and agreements are in place to meet all EPPRD requirements and that bilateral/multilateral arrangements are in place to remove any impediments to cross border emergency responses*

### *Action 1.4* *Align domestic and international market access policy and operations to identify and capture efficiencies in their delivery through integrated export systems and processes*

In Australia, interstate movement of plants, plant products and other vectors of plant pests (e.g. machinery and packaging) are controlled under legislation administered by individual state and territory governments to provide entry conditions for items considered to be of phytosanitary concern. There are opportunities to better align production and phytosanitary arrangements and their delivery for interstate trade with those for exports to international markets where pest risks are common. Integrating domestic and international export systems and processes will likely offer opportunities to increase efficiency, expand market access options and reduce regulatory process costs. These should be explored in parallel with the Australian Government export reform processes.

### *Action 1.5 Review domestic and international phytosanitary certification processes for the movement of plants and plant products, focusing on the national adoption of electronic systems for certification by government inspectors and by businesses accredited under approved schemes*

Entry conditions for interstate trade of plants and plant products often require certification to accompany the risk items as evidence that the entry conditions of the importing state and territory government have been met. This system is designed to prevent the establishment of new plant pests where they currently do not exist in the regulating state or territory.

Current certification methods for domestic quarantine are based on a paper system. The establishment of a national electronic certification system would provide a range of benefits, such as enhanced security and integrity, improved traceback ability and the basis for integration of domestic and international certification. In addition, the adoption of an electronic certification system would also reduce certification costs for both industry and government. It is therefore recommended that a national electronic certification system for domestic trade be established. In time, this system could be integrated with international certification schemes.

A review of current systems will identify opportunities for improved national consistency and increased efficiency and will identify improvements that can be made to the certification system. This review can include other third party processes being developed by industry. For example BioSecure Hazard Analysis Critical Control Point (*HACCP*) is a new system being developed by Nursery and Garden Industry Australia (NGIA) to offer phytosanitary certification for domestic market access under an industry managed system. The potential for such models to be extended to other sectors would be explored.

### *Action 1.6 Develop a process for government and industry education and training on regulatory processes and obligations at national and international levels**

Increasing stakeholder understanding of the interstate certification process, the SPS Agreement and the relevant domestic and international phytosanitary regulations will greatly assist in ensuring national consistency is achieved over time. Well educated stakeholders will be needed to assist in the development of future regulations that are nationally harmonised and consistent with Australia's international obligations.

*See also Recommendation 7

## Recommendation 2:

**Provide resources and appropriate processes to ensure the development and implementation of nationally consistent plant biosecurity legislation and regulations**

### *Action 2.1 State and territory governments commit sufficient resources to implement the actions recommended under this strategy*

Agencies need to commit resources to reviewing and revising regulations and operational procedures. This will lead to improved interstate market access through rapid completion of risk analyses and operational documents, a streamlining of certification requirements and a reduction in certification costs.

# Strategies *continued*

## Strategy 2 | Establish a nationally coordinated surveillance system

| Limitations of the current system | Vision for 2020 |
|---|---|
| • Largely state based agencies resource and undertake surveillance activites | • The development of a nationally coordinated and targeted surveillance system that supports the early detection of new pests, reports evidence of area freedom, enhances pest incursion responses and supports the effective management of established pests |
| • Surveillance activities largely provided on a fragmented basis by a range of agencies | • The establishment of a national surveillance coordination centre with responsibility for reviewing the national design, collection, capture and analysis of data. Roles and responsibilities allocated, coordinated and facilitated on a national basis. Resources allocated on a risk return basis |
| • Some surveillance systems not fully operational resulting in patchy coverage. Under utilisation of community and passive surveillance mechanisms | • A mechanism to engage industry, regions and communities to ensure broader recognition of the importance of passive surveillance and collection of surveillance data |
| • Inadequate delivery and uptake of national standards, analytical tools and protocols | • Establishment of nationally agreed standards and plans for the collection of surveillance data for priority pests for the purposes of early detection and market access |
| • Inadequate use of existing passive surveillance and strategic targeted surveillance where there are no market guidelines | • Secure, accessible integrated data sets that include offshore and onshore intelligence and development of supportive analytical tools |

Plant biosecurity surveillance involves activities designed to:

- Demonstrate the absence of pests (for domestic and international market access)
- Reveal the presence of pests (for early detection)
- Determine the distribution of pests in response to an incursion or for ongoing management

Data collected within surveillance programs are essential for supporting claims of pest status within regions, states and Australia.

Incursions of pests continue to occur, even with the best efforts of quarantine services. Early detection of quarantine pests (exotic and established) through effective surveillance can improve the chance of eradication or containment within a region. If eradication or containment is not technically feasible, early detection in conjunction with contingency planning and preparedness can enable more rapid and effective management responses to be mounted.

Surveillance is the major operational component of a pest eradication campaign. Through surveillance, the initial extent of the incursion is determined, the eradication campaign is monitored and the determination of the pest eradication is achieved. Surveillance is important because it documents and monitors Australia's plant pest status and assists in determining export conditions, import policy and helps measure the impact of climate change and variability. Surveillance design should include sufficient statistical rigour to provide confidence in the outcomes. Surveillance must be supported by a strong system of diagnostic expertise to ensure that detections resulting from targeted and passive surveillance activities are correctly and rapidly identified (see Strategy 5).

In the national context, Australia's surveillance effort has lacked coordination and structure for the design, collection and capture of data in conjunction with formal links to diagnostic support. The Beale Review Panel recommended that a comprehensive monitoring and surveillance program for national priority exotic pests be established to substantially increase the effort in detecting and managing post-border risks[1].

## National surveillance system

Surveillance activities are currently undertaken by all state and territory governments, the Australian Government and through research programs. Summary data from many surveillance programs are being captured in the National Plant Surveillance Reporting Tool (NPSRT) database. In addition, the Biosecurity Surveillance Incident Response and Tracing (BioSIRT) system is now being used by a number of state and territory governments to record surveillance data.

Passive surveillance collected by research programs, industry consultants, commercial diagnostic laboratories, government staff and the community, can also contribute to national data sets. However, record keeping is generally not managed in a way that facilitates capture in NPSRT, and in most cases, formal mechanisms to capture data from these sources have not been identified or implemented. Opportunities exist under the National Plant Biosecurity Surveillance Strategy (NPBSS), a substrategy under the NPBS, to better define and provide a more coordinated approach to collection and capture of surveillance data across sectors, states and territories.

A national surveillance system is required to ensure that data are collected in a coordinated and consistent manner, thereby making the most cost effective use of limited resources and ensuring Australia's capacity and capability to conduct surveillance is maintained.

**Recommendation 3:**

**Facilitate the development of a nationally coordinated and targeted surveillance system that provides intelligence, supports the early detection of exotic plant pests, reports evidence of area freedom, enhances pest incursion responses and supports the effective management of established pests**

### *Action 3.1 Establish nationally agreed standards and plans for the collection of surveillance data for priority plant pests for the purposes of early detection and market access*

Surveillance protocols will be developed to ensure that data sets are collected nationally to agreed minimum standards, which provides intelligence to underpin risk based allocation of resources, support area freedom for market access and facilitate early detection of priority pest threats. All sectors will be required to implement these surveillance protocols to agreed standards as appropriate.

To avoid duplication and make the most efficient use of resources, strategies will be developed that capture data for multiple pests where possible. This will involve targeting surveillance at high risk sites for pest entry and establishment and incorporating passive surveillance from all sectors.

# Strategies *continued*

Surveillance standards will include combinations of both targeted and passive surveillance to be undertaken for priority pests as appropriate. To assist implementation of these surveillance plans within industry, collection of data will be included within industry Quality Assurance systems, crop monitoring or management systems where these programs are appropriate and/or available.

The national surveillance system will be closely linked with the national diagnostic system to make best use of resources and ensure that Australia has the capacity and capability to diagnose priority pests to agreed standards.

### *Action 3.2 Establish a national surveillance coordination centre with responsibility for reviewing the national design, collection, capture and analysis of data*

A national surveillance coordination centre will bring together expertise in surveillance, monitoring and data analysis. Its purpose will be to review the collection and quality of surveillance data from a national perspective and will support requirements for both early detection and evaluation of pest distribution. The national surveillance coordination centre will provide nationally endorsed statistical design and analysis of surveillance data from government, research, extension and consultant activities.

### *Action 3.3 Establish a mechanism to engage industry, regions and communities to ensure broader recognition of the importance of surveillance and collection of surveillance data**

The national surveillance system will develop and implement mechanisms to engage and gain commitment from producers, industry personnel, research and government staff and the community in the collection of data from passive surveillance in ways that will meet national surveillance standards. The national system will need to record negative presence data (the zeros) as well as positive pest specific data. The system will improve awareness of the risks associated with new pest introductions and pathways for pest incursions.

*See also Recommendation 13

### *Action 3.4 National surveillance protocols should be developed and linked with Quality Assurance systems and accreditation to act as a driver for creating capacity and capability*

The national surveillance system should develop and implement education, training and accreditation programs for recognition of pests and improved understanding of reporting mechanisms and procedures. Linking with existing Quality Assurance programs provides an effective driver for the implementation of key aspects of the national surveillance system.

*Image courtesy of PHA*

## Strategy 3 | Build Australia's ability to prepare for, and respond to, pest incursions

| Limitations of the current system | Vision for 2020 |
|---|---|
| • A large number of stakeholders and wide range of pest threats potentially reduces the opportunity to maintain timely response times and operational mobilisation | • A plant biosecurity emergency response system that provides early detection of pests, rapid response activation and efficient and effective operational implementation<br>• All resources and services needed to address an incursion are available and trained so they can be effectively mobilised and deployed |
| • Training targeted at individual biosecurity sectors, emergency response agencies and regional jurisdictions | • Emergency response training is available and being delivered at the appropriate frequency and meeting role needs<br>• Trained personnel and material resources available to transfer nationally where the needs arise |
| • Contingency plans are not currently available for all High Priority Pests | • Contingency plans covering all identified HPPs in place, with the allocation of agreed national roles and responsibilities |
| • The EPPRD does not cover all pests (e.g. weeds) that could have an impact on plant production systems | • Pre-agreed, risk based national response and cost sharing arrangements in place for all pests (including weeds) |
| • Current decision making processes are based on state boundaries and funding availability | • A national risk based decision making and investment framework in place that guides the efficient allocation of plant biosecurity resources, maximises return on investment and establishes a transparent and objective decision making process |

If exotic pests are detected in Australia, the national biosecurity system provides a critical line of defence and allows a rapid and effective emergency response to be implemented. Australia's existing arrangements are regularly tested and improved, yet there are significant challenges to these arrangements. Ongoing viability of Australia's response capability and capacity is by no means assured.

Successful emergency responses to pests are dependent on early detection, rapid activation, and efficient and effective operational implementation. If all these elements are in place, there is a higher probability of a successful eradication program. Therefore, pre-existing arrangements ensure that when an incursion occurs, all resources and services needed to address the incursion can be effectively mobilised and deployed.

Australia has developed unique and effective instruments to manage exotic pest incidents. The EPPRD is a formal legally binding agreement between PHA, the Australian Government, all state and territory governments and national plant industry peak body signatories. It was developed to cover the management and funding of responses to EPP incidents, including the potential for ORCs for producers. It also formalises the role of plant industries in decision making as well as their contribution towards the costs related to responses.

# Strategies *continued*

The ratification of the EPPRD in 2005 significantly increased Australia's capacity to respond to plant pest incursions. The key advantage of the EPPRD is more timely, effective and efficient response to plant pest incursions, while minimising uncertainty over management and funding arrangements.

In the context of the NPBS, the EPPRD provides a driver for improved performance. It has enabled an improved emergency response system to be developed and additionally provided insight and context for maintaining and expanding national emergency response capability and capacity. In particular, the EPPRD provides a potential framework for the future management of weeds.

**Recommendation 4:**

**Continue to review and improve emergency response efficiency and effectiveness through improved processes, decision making, education, training and accreditation of personnel**

### *Action 4.1 Continually review and improve joint industry and government decision making and response management arrangements to ensure they are rapid, collaborative, clear, effective, efficient and meet stakeholder expectations*

There is a requirement to explore and adopt options for early intervention in pest incursion situations. For example, rapid response teams, clarification and mitigation of legal liability risks and systems that reduce complexity of response. In addition, there are opportunities for collaborative industry approaches to emergency preparedness and response, such as joint biosecurity resourcing, regional collaboration, or collaborating with community based groups or other industry groups.

In the area of biosecurity communication, there is a requirement to adopt and continually improve arrangements for communication across all levels and facets of emergency response. This should include national, state and territory and regional communication, operational communication, media and public awareness and the development of specific, targeted communication plans as appropriate.

### *Action 4.2 Gain national commitment to ensure emergency response training is available, delivered at the appropriate frequency and meeting role needs**

Emergency response training should include integration across biosecurity sectors and emergency response agencies to increase the efficiency and transferability of human and material resources nationally.

*See also Recommendation 7

### *Action 4.3 Increase efficiency by identifying and addressing gaps and overlaps in responsibilities of relevant national, state and territory, and regional authorities in emergency management roles*

Australia has well established arrangements for responding to biosecurity incidents and emergencies. These are supported by legislation, high level agreements and plans (e.g. the EPPRD and PLANTPLAN[28]).

Although these response arrangements are largely sector specific, they do include generic elements. Therefore the opportunity exists to reduce duplication by identifying where overlaps and gaps exist. The Biosecurity Emergency Preparedness Working Group (BEPWG) has been established by the National Biosecurity Committee (NBC) to optimise opportunities for cross sector emergency preparedness. BEPWG will achieve this by building an enhanced national capability, including the harmonisation of the generic elements of biosecurity emergency preparedness and response arrangements.

BEPWG is working across all biosecurity sectors to ensure that Australia's biosecurity emergency preparedness and response arrangements are consistent with those currently utilised by other response organisations, within Australia and internationally.

### *Action 4.4 Develop a nationally agreed approach where eradication is technically not feasible*

The containment and eradication of exotic plant pests are currently covered by national response agreements. However, where containment and eradication is determined to be unfeasible, new national arrangements are required to cover the transition from emergency response to ongoing pest management, with the engagement of both goverment and industry as appropriate.

### *Action 4.5 Develop forecasts of expected production by plant industries as a biosecurity risk management, preparedness and response tool*

The development of new production areas and changes to land use (e.g. the selection of new and alternative crops) has the potential to accelerate in response to external factors, such as climate change and variability. This will induce new pest pressures and shift pest risks. For example, the introduction of sugarcane (*Saccharum officinarum*) into the Ord irrigation area in Western Australia provided a stepping stone for Sugarcane smut (*Ustilago scitaminea*) in 1998. The plantings were geographically close enough to Indonesia for spores to be moved by wind dispersal into the north of Australia.

Understanding the risk associated with potential changes in production improves the ability to prepare for and prevent exotic pest incursions. Pest risk analysis studies for specific production areas would improve the ability to prepare for and prevent exotic pest incursions in regional areas.

### *Action 4.6 Stakeholders provide resources to ensure that baseline capacity is sufficient to meet normal commitments under the EPPRD and similar instruments, through the development of normal commitment benchmarks, performance standards and regular reporting*

As part of the EPPRD, Parties have agreed to determine resource commitments to EPP responses that are 'normal'. Only costs above this level should be eligible for Cost Sharing (as defined in the EPPRD).

The purpose of defining normal commitments is to ensure Parties understand their potential commitments in an incursion response up front. It also serves to improve funding certainty during a response, assist with response planning and incident management, and promote rapid responses to emergency situations. The level at which this benchmark is defined will impact the magnitude of funding that could be Cost Shared, and consequently whether a response will be cost-beneficial.

The concept of normal commitments is common to the EPPRD, EADRA and NEBRA. The development and application of universal normal commitment benchmarks would facilitate the agreement and ratification by all Parties to normal commitments under EPPRD arrangements.

### *Action 4.7 Develop pre-agreed, risk based national response and cost sharing arrangements for pests not covered by existing arrangements*

As indicated on page 21, the NEBRA extends emergency response arrangements already established in the primary production sectors to the environment and social amenity sectors, and establishes the capacity to commit funding immediately in the event of an emergency.

The management of weeds in production systems is not currently covered under the EPPRD, and while weeds are covered under the NEBRA, industry engagement and collaboration in weed emergency response and preparedness is still to be addressed.

# Strategies *continued*

Inclusion of Emergency Weeds in a formal response agreement that is linked with production systems (e.g. EPPRD or EADRA), through either an addition to the current agreement or through the development of a new arrangement, would provide:

- A framework for emergency responses to Emergency Weeds that impact on production systems
- A determination of cost sharing arrangements covering an Emergency Weed response
- A determination of the normal commitments of all Parties (government and industry) to Emergency Weed management functions. These normal commitments may include activities such as risk mitigation, diagnostic capability, reporting timeframes, surveillance activities, participation in consultation and emergency response capacity

**Recommendation 5:**

**Develop contingency plans or business continuity plans covering all HPPs**

***Action 5.1*** ***Develop contingency plans or business continuity plans for all identified HPPs with the allocation of agreed national roles and responsibilities***

A key part of industry preparedness for a possible incursion of a new pest is the development of contingency plans. These documents can be pest specific or cover groups of pests with similar biology or those which would require similar response activity. Contingency plans provide detailed information on a pest's life cycle, current and potential distribution, survival strategies and methods for surveillance, diagnosis, sampling and control. Using this information, contingency plans form the basis for the development of Response Plans which are developed following the detection of an EPP.

Response Plans developed using information from a contingency plan follow procedures as set out in PLANTPLAN (the nationally endorsed operational guideline for an EPP incursion response) and are endorsed by the National Management Group (NMG) prior to implementation. Through this mechanism, contingency plans aid a rapid decision making process for emergency response to a pest incursion.

The identification of priority pest threats is a valuable part of biosecurity preparedness. Through the EPPRD and development of Industry Biosecurity Plans (IBPs), PHA's Members have assessed these threats and ranked them according to their entry, establishment and spread potentials as well as their potential economic impact. Through this process, the pests with the highest overall risks from each industry have been combined to generate a list of over 300 HPPs (which is available from PHA).

It is envisaged that this HPP list will guide industry and government biosecurity preparedness activities including the development of contingency plans.

**Recommendation 6:**

**Develop a national risk based decision making and investment framework that guides the efficient allocation of plant biosecurity resources, maximising return on investment and establishing a transparent and objective decision making process***

Plant biosecurity strategies and resources need to be targeted towards those areas that produce the greatest reduction in the probability and consequence of an exotic pest incursion at the least cost for stakeholders. Therefore, there is a requirement to apply resources using an evidence and risk based approach so that input resources can be distributed efficiently[1].

The decision making and investment framework will facilitate:

- Appropriate risk prioritisation and investment across economic, environmental and social objectives
- The development and implementation of agreed methodologies for conducting risk and benefit/cost analysis
- Enhanced information and tools for risk profiling and risk based resource allocation
- A national capability to undertake risk analysis and benefit/cost analysis for nationally significant pests
- Enhanced intelligence gathering and sharing of information that guides intervention activities and the allocation of resources

*See also Action 11.2 and 11.3

*Image courtesy of PHA*

# Strategies *continued*

## Strategy 4 | Expand Australia's plant biosecurity training capacity and capability

| Limitations of the current system | Vision for 2020 |
|---|---|
| • Declining numbers of graduates entering and finalising training in agriculture and postgraduate research | • A strong and stable biosecurity training capability that underwrites the ongoing needs of the national plant biosecurity system |
| • A shortage of people with appropriate plant biosecurity skills and knowledge in some science areas<br>• Difficulties experienced in attracting people to the agricultural sector and retaining these individuals in the profession | • A national training framework that meets existing and anticipated future skill gaps |
| • Plant biosecurity sector highly dependent on 'normal' day-to-day capacity, management and research staff to manage emergency response | • A national management framework that integrates emergency response capability and surge capacity across agencies and sectors, using harmonised inter and intrastate arrangements |

Whilst there continues to be depth of expertise throughout the plant biosecurity system, some areas are beginning to experience shortages of people with the appropriate plant biosecurity skills and knowledge. This is compounded by current difficulties experienced in attracting people to the agricultural sector and retaining these individuals in the profession. Research and diagnostic capability are areas that have been specifically identified to be at risk.

Furthermore, Australia's emergency response capacity is currently drawn from day-to-day capacity, management and operational staff together with significant support from the research and development sector. Thus, major incidents can have consequential impacts not only on the affected private and public stakeholders, but also on the viability of the plant biosecurity system in its entirety.

Australia's future plant biosecurity system will require ongoing access to adequately trained and educated personnel capable of maintaining a world class biosecurity system. It is a fundamental and enabling requirement that underpins all facets and components of the system.

The plant biosecurity system will be best supported by a national biosecurity curriculum that provides a continuum of educational opportunities that are both competency based and offered at multiple levels within the higher education system.

**Recommendation 7:**

**Maintain and enhance Australia's plant biosecurity training capability and capacity to underpin the ongoing needs of the national plant biosecurity system**

### *Action 7.1 Develop a national training framework (at both tertiary and vocational levels) to fill existing and anticipated future skill gaps*

The plant biosecurity curriculum is a component of what might become a broad based education and training framework. This could integrate vocational and tertiary elements necessary to deliver all components of the biosecurity system. The framework could link to the emergency response training by state and territory governments and agencies as well as other required competencies.

### *Action 7.2 Assessment and appropriate allocation of Australian Research Council (ARC) and RDC funding that contributes to the training of Australian scientists in plant biosecurity related disciplines*

Improving training in the identification, biology and management of both established and exotic pests will provide increased surveillance, diagnostic and research capacity and capability. These trained personnel will also act as a resource for managing EPP incursions. The allocation of funding from ARC, RDCs and other sources needs to be assessed to ensure the most effective outcomes in relation to training.

### *Action 7.3 Link undergraduate and postgraduate scholarships to industry and government employment opportunities*

Too few graduates are taking up the opportunity to study for a higher degree that is required to enter a career in agricultural research. This is, in part, due to postgraduate stipends that are low and unattractive. It is estimated that the annual demand for graduates exceeds three times the number of graduates from Australian universities[12].

Linking undergraduate and postgraduate scholarships to industry and government employment opportunities would provide a mechanism to attract skilled graduates and train them in the plant biosecurity arena. This could be achieved through mechanisms such as the Cooperative Research Centres (CRCs).

### *Action 7.4 Develop a mechanism to generate surge capacity in laboratory and operational staff in the event of an EPP incursion*

Defining critical emergency response roles and identifying the required national capacity to meet them, allows for the determination of a mechanism to generate surge capacity (the ability to obtain additional resources during an emergency) in laboratory and operational staff. National formal commitments to ongoing maintenance of capacity to fill these roles can be sought.

The integration of emergency response capability and capacity across agencies and sectors, using approaches such as inter and intrastate arrangements and harmonising management frameworks would enable:

- National coordination during a response
- Capability, knowledge and resource transfer
- Integration of systems
- Increased ‘peak’ capacity for major responses or multiple emergencies

### *Action 7.5 Instigate annual plant biosecurity workshops to enable professional networking and information exchange*

Annual plant biosecurity workshops would enable networking and help facilitate the exchange of plant biosecurity diagnostics, surveillance training and emergency management knowledge amongst the professionals involved. It would allow plant biosecurity diagnosticians to share their skills and expertise in particular areas such as individual plant pests, diagnostic methodologies and technologies, and laboratory quality management.

# Strategies *continued*

## Strategy 5 | Create a nationally integrated diagnostic network

| Limitations of the current system | Vision for 2020 |
|---|---|
| • Largely independent state based decision making | • A nationally integrated diagnostic network with capacity and capability to diagnose plant pests, maintain core capacity and deliver services in a cost effective and timely manner across a full range of diagnostic needs |
| • Diagnostic services largely provided on an ad-hoc basis by a range of agencies | A network that:<br>• Has a comprehensive coverage of both exotic and established pests<br>• Provides a quick turnaround of results<br>• Has the capacity to deal with large numbers of samples<br>• Works seamlessly across states and territories |
| • Nationally, some 70 separate government laboratories, museums, universities and commercial entities provide diagnostic services | • A diagnostic system that operates in a cooperative manner across all agencies and across state borders |
| • Surge capacity is highly dependent on research personnel and infrastructure on an ad-hoc basis | • Roles and responsibilities allocated, coordinated and facilitated on a national basis<br>• National priorities allocated across states, territories and sectors |
| • Many diagnostic areas are under-resourced with insufficient available expertise and infrastructure to manage both established and exotic pest incursions | • An integrated and coordinated network of laboratories based on Australia's climatic zones that collectively develop, adopt and implement a wide range of diagnostic technologies across a breadth of pests |
| • Some diagnostic resources are duplicated in more than one state and/or territory | • Laboratories networked and resourced to develop and maintain agreed diagnostic standards for priority pests |

Fast and accurate diagnosis is also a critical component of surveillance activities. Without the ability to rapidly diagnose pests, surveillance activities to both quantify the magnitude of an incursion and determine and execute an appropriate response would not be effective. One of the underlying principles of the EPPRD and associated normal commitments for government signatories, is the maintenance of access to diagnostic services at all times, for the diagnosis of suspected EPPs and unknown pests.

As well as being an essential component of any eradication effort, diagnostic capacity also underpins many of the everyday management practices involved in the production and trade of plant products. Pest management programs, including the selection and application of registered pesticides, rely on the accurate identification of pests. Rapid identification also supports quarantine processes, such as area freedom, and underpins interstate and export certification assurance, that allow access to both domestic and international markets.

In summary, diagnostic capacity is required to:

- Support everyday decision making in production agriculture
- Enable targeted pest control
- Provide supporting evidence on a country or region's pest status
- Enable early detection of suspected EPPs
- Support response actions on both established and exotic pests

These critical diagnostic services are widely distributed across every state and territory. Services are generally provided from cities to regional centres in most of Australia's major agricultural production areas.

The majority of diagnostic services are provided by state and territory governments with some additional services being delivered by commercial laboratories, CSIRO and universities. Services are provided on an ad-hoc, commercial and/or nationally coordinated basis, as required. Diagnostic operations are often performed in conjunction with collaborative research activities being undertaken on pests of concern.

A number of essential operational elements are required to ensure that Australia's diagnostic system is both sustainable and effective. These elements are:

- Capability and capacity
- Standardised diagnostic protocols
- Laboratory quality management
- Communication, networking and data sharing
- Governance

**Recommendation 8:**

**Develop a nationally integrated plant biosecurity diagnostic network that underpins Australia's plant biosecurity system**

***Action 8.1*** *Establish a nationally integrated plant biosecurity diagnostic network**

Australia requires a nationally integrated diagnostic network with capacity and capability to diagnose exotic and established plant pests, maintain core capacity and deliver services in a cost effective and timely manner across a full range of diagnostic needs.

The diagnostic network will:

- Have comprehensive coverage of both exotic and established pests
- Provide a quick turnaround of results
- Have the capacity to deal with large numbers of samples
- Be cost effective and reliable
- Allow low levels of target organisms to be detected
- Provide access to all technologies required to make an effective diagnosis
- Fit within broader international networks and standards on diagnostic testing protocols

# Strategies *continued*

Australia needs to establish a comprehensive network of expertise covering all significant pest groups that operates in a cooperative manner across all agencies and across state borders. In building an effective operational network, challenging issues will have to be overcome, including defining responsibilities, addressing resources and the current lack of a national policy on pest diagnostics.

The mandate for the development of an enhanced National Plant Biosecurity Diagnostic Network (NPBDN) already exists. Australia already has both international (e.g. IPPC) and national obligations to maintain capability and capacity in plant biosecurity diagnostics. At the national level, as signatories to the EPPRD, state and territory governments are committed to maintaining response capacity for EPP incursions and, where possible, internationally recognised diagnostic standards should be used. The availability and accessibility of these diagnostic standards will be important, as any action taken when a pest is detected must be based on accurate identification.

An enhanced NPBDN is required to ensure greater coordination of resources, thereby building core capacity and facilitating the dissemination of information between stakeholders.

*See also Action 15.2

### *Action 8.2 Establish a harmonised approval process for the transfer of suspect and confirmed samples of priority plant pests between laboratories**

In the case of a plant pest incursion, diagnostic samples often need to be transported across state and territory borders to utilise the diagnostic expertise of the national system, especially for confirmatory or definitive diagnosis. This movement of samples would continue, or even increase, under the proposed NPBDN.

Currently, the movement of diagnostic samples between laboratories is subject to the entry and movement restrictions in the plant biosecurity legislation of each state and territory. In order to ensure a rapid response to priority pest incursions (both exotic and established), a harmonised approval process must be implemented to allow diagnostic samples to be efficiently transferred between Australian diagnostic laboratories. This process should ensure that delays in the movement of samples are minimised, and requirements for sample packaging, dispatch, movement and receipt are standardised to provide secure sample submission.

*See also Action 10.2

### *Action 8.3 Establish an integrated and coordinated network of diagnostic centres based on Australia's climatic zones*

The NPBDN must be supported by an integrated and coordinated network of laboratories that collectively develop, adopt and implement a wide range of diagnostic technologies across a broad range of pests.

As a key component of Australia's plant biosecurity diagnostic infrastructure, the network of laboratories should encompass general plant pathology, entomology, virology, bacteriology, molecular biology, mycology, nematology and weed science with coordinated and targeted funding from the Australian Government, state and territory governments and industry.

The NPBDN should be underpinned by a series of national diagnostic centres located in appropriate climatic regions that enable appropriate expertise and facilities to support tropical, sub-tropical, temperate and Mediterranean crop/pest interaction and diagnosis. Each facility should retain the ability and facilities to support the rest of the network.

The laboratories will provide:

- The development and maintenance of national diagnostic standards
- A focal point for Australia's plant pest diagnostics, both domestically and internationally
- Access and proficiency at all locations in a wide range of diagnostic tools and technologies
- Development and adoption of new technologies resulting from research innovation and adoption/adaptation from overseas

- Specialist training in key HPPs, pests under official control and economically important established pests for which accurate and timely diagnoses are essential for early detection, market access and effective pest control
- Support and training in existing and new technologies for regional diagnostic operational reference and field laboratories around Australia

### *Action 8.4 Key roles and responsibilities agreed amongst agencies on a nationally coordinated basis*

In order to prevent overlap and duplication of valuable resources, networked laboratories should be resourced to develop and maintain agreed diagnostic standards for priority quarantine pests. These should be distributed among laboratories in a national context.

With responsibilities agreed and allocated, these national diagnostic centres will be charged with retaining a rapid diagnostic capability for specific priority pests and linked back to relevant processes for the identification of high risk pest threats on a national basis. In this way, state and territory governments will be able to support other states and territories by providing diagnostic services in the event of a plant pest emergency.

Allocation of roles and responsibilities should be coordinated and facilitated on a national basis and advice forwarded to the relevant authorising body for implementation.

### *Action 8.5 Design and develop a National Plant Biosecurity Diagnostic Strategy (NPBDS) within the NPBS framework, which identifies key goals, objectives, timelines and resource requirements*

The NPBDS should outline key goals and objectives, milestones, timelines, governance and resource requirements supported by benefit/cost analysis and a strong business plan in line with the NPBS. It should also provide a vision for the development of a plant biosecurity diagnostic system at the national level that can effectively meet Australia's plant biosecurity diagnostic requirements. The NPBDS should be underpinned by an implementation plan.

*Image courtesy of hickspixoz.com*

# Strategies *continued*

### *Action 8.6 Develop a process to encourage new diagnosticians to enter the field and enable continued professional development of current diagnosticians*

A process to encourage new diagnosticians to enter the field of plant biosecurity diagnostics and to enable the continued professional development of current diagnosticians is necessary to maintain an adequate degree of capability and capacity. In the past decade, many specialist diagnosticians have retired from the field, leaving gaps in the capability. A mechanism to introduce new diagnosticians and support existing diagnosticians in plant biosecurity diagnostics is necessary to maintain an appropriate level of expertise. The options for maintaining this capability may include succession planning, mentoring programs, scholarships and training opportunities.

Plant biosecurity diagnostic capability and capacity includes:

- Maintenance of skills, expertise and knowledge across plant pathology and entomology, including specialist disciplines (e.g. bacteriology, mycology and nematology) and a range of skill bases (e.g. taxonomy, field pathology and molecular biology)
- A national approach to maintain core capacity and minimise duplication
- Access to biological resource collections
- Linkages and access to regional, state and national expertise
- Linkages and access to overseas expertise
- Education and training
- Mentoring capacity
- Professional development and career path options for diagnosticians
- Facilities and equipment
- The ability to generate surge capacity

**Recommendation 9:**

**Implement, maintain and manage appropriate quality management systems in plant biosecurity laboratories undertaking diagnostic testing**

A laboratory quality management system is a tool for estimating and managing risk. The adoption of an accreditation standard has the advantage of covering both management and technical elements of a laboratory quality system and there are a number of independent standards that can be used to provide a comparative benchmark on the status of each laboratory. Accreditation provides an unbiased review of staff competency, documented procedures, internal quality control, proficiency testing and performance monitoring and improvement procedures.

### *Action 9.1 Develop a network of plant biosecurity diagnostic laboratories that have the ability to deliver diagnostic testing to the quality required by the customer*

In Australia, all government animal health diagnostic laboratories are accredited by the National Association of Testing Authorities (NATA) to the international ISO/IEC 17025 standard[29]. Only three plant biosecurity laboratories are currently accredited. The development and implementation of laboratory quality systems within plant biosecurity diagnostic laboratories is essential to mitigate the substantial risks associated with plant diagnostics.

### *Action 9.2 Governments to take responsibility for establishment and ongoing costs of maintaining appropriate quality systems for diagnostic laboratories*

At present, the majority of the state and territory government plant biosecurity laboratories do not have laboratory quality management systems in place. These agencies need to consider introducing quality management systems into their plant biosecurity laboratories so they meet an adequate standard of operation suitable for plant biosecurity diagnostics.

**Recommendation 10:**

**Endorsed National Diagnostic Protocols (NDPs) for all HPPs be developed and maintained**

Diagnostic protocols are documents that contain detailed information about a specific plant pest, or a related group of pests, relevant to its diagnosis. In the absence of international standards, the diagnostic protocols provide a routine set of protocols for identifying an unknown pest, or group of pests, to a defined level. Such information is crucial for the management of exotic pests, including:

- General surveillance for pest status
- Testing of material for compliance with phytosanitary certification procedures
- Surveillance as part of an official control or eradication program
- Routine diagnosis for pests found in imported consignments and detection of a pest in an area where it is not known to occur

Development and maintenance of nationally agreed diagnostic protocols should be prioritised using a risk based framework. Currently only a few nationally recognised diagnostic protocols for HPPs are available or under development.

### *Action 10.1 Regularly prioritise diagnostic protocols for development and review using a contemporary risk based approach*

There are currently over 300 HPPs for which diagnostic protocols should be developed. Efficient and effective development and review of diagnostic protocols requires that a risk based approach is taken to prioritising the order in which protocols are developed and reviewed. Factors to consider in prioritising the development and review of diagnostic protocols include:

- The risk of entry, establishment and spread of the pest
- The degree of difficulty managing the pest if it was to become established in Australia
- The availability of appropriate skills and expertise for the particular plant pest

### *Action 10.2 Develop a national policy to facilitate access to reference material and positive controls for diagnostic tests by ensuring appropriate processes and containment protocols are in place for their importation, storage and handling*

The development and validation of diagnostic standards requires access to positive and negative controls. These materials often need to be imported from outside Australia and a national policy must be established for the routine importation, containment, storage and handling of reference materials as required. This policy needs to take account of the risks involved in importing positive controls, appropriateness of import conditions and be responsive to the needs of all government and industry stakeholders.

# Strategies *continued*

## Strategy 6 | Enhance national management systems for established pests

| Limitations of the current system | Vision for 2020 |
|---|---|
| • A large number of stakeholders (both government and industry) are currently responsible for collating pest information | • Diagnostic and management information consolidated into comprehensive data sets and readily available to all relevant parties as part of a nationally integrated approach for management of significant established pests |
| • A large number of stakeholders (both government and industry) can reduce the effectiveness of a national management system. Decision making is undertaken by state and territory governments according to regional political and operational drivers | • Decision making support tools used that assess likely spread and impact of established pest species and shifts in risk profile. National decision making support tools used to allocate resources and guide management operations |
| • Resources allocated on agency and regional political basis | • Systems in place to optimise effective resource allocation based on accurate pest management operation costings |

Many pests are already well established in Australia and continue to have a negative impact on Australia's economy, biodiversity and way of life. Others are yet to reach their full distribution and impact. Some are managed through containment programs such as quarantine areas, exclusion zones and movement controls, others by the minimisation of impacts through measures such as biological control, Integrated Pest Management (IPM) or plant breeding programs.

Management of established pests is vital to ensure sustainable production and to maximise market access for Australian plants and plant products and enhance protection of the environment. When specific eradication programs are developed, the objective is to totally eliminate the pest from the ecosystem. However, for most established pests, the usual purpose of the control program is to minimise damage and prevent pest populations expanding into new areas.

In many production systems, optimum pest management outcomes can be achieved by adopting an integrated approach to pest management. That is, a selection of different management tools and techniques that can be assembled, interchanged and applied in different combinations to maximise the management effect and obtain the best outcome. Integrated approaches to pest management are sometimes described using a toolbox analogy.

*Image courtesy of DPIPWE*

## Recommendation 11:

Enhance the national management system for established pests

### *Action 11.1 Develop a nationally integrated approach for management of significant established pests that consolidates information into national data sets*

Efficient management of established pests requires the ability to collect, share and analyse data. This requires the collection of technical data relating to pests into advanced data sheets. Where available and appropriate, the existing systems and resources from other sectors should be used or adapted to maximise the benefit achieved. Once collated, this information should be available to assist with management decisions and the information within the data sets should be refereed to ensure its integrity.

Relevant information that should be contained within the data sets includes management practices relevant to the pest, as well as technical information on the biology, epidemiology, detection, diagnosis and quarantine arrangements. This information will aid in determining best management practices, pest entry potential and support regional authorities to allocate plant biosecurity resources to the best effect.

### *Action 11.2 Establish systems to accurately determine the cost of pest management operations and guide the effective allocation of resources*

Benefit/cost analyses should be regularly undertaken to determine the value of major operations. This routine analysis should also consider the impact of using the resources for other activities, or employing alternative management strategies. An accurate assessment of options can optimise production and reduce supply chain losses due to pests, while also reducing pesticide use.

### *Action 11.3 Develop national decision making support tools that can assess the likely spread and impact of established species and determine shifts in pest risk profiles*

There is a need to develop effective decision making support tools that can be used to guide pest management operations and the efficient allocation of resources. The impact and activity of plant pests can change in response to the local environment (e.g. climate, availability of host material and soil conditions). National decision making support tools that can rapidly determine changes in pest activity, spread and impact would enable predictive assessments to be made that could optimise management responses and guide the cost effective allocation of resources.

### *Action 11.4 IPM should be encouraged where applicable as the baseline for established pest management operations*

Management operations for pests must be sustainable and demonstrate best practice approaches. Integrated approaches to crop management offer optimum benefits in terms of likely success as well as the potential for minimising negative impacts. A comprehensive approach to IPM should include ongoing assessment of new and more effective management techniques.

### *Action 11.5 Promote and facilitate active development and introduction of new plant varieties using both traditional breeding and other plant biotechnology techniques (including genetic modification), where consistent with state and territory legislation, that are resistant to pest attack and better adapted to regions subject to climate change and variability*

Plant breeding is a major tool capable of conferring desirable traits to commercial plant varieties. Both traditional plant breeding and modern biotechnology, including genetic modification, are capable of developing new plant varieties that are resistant to pest attack and adapted to local environmental conditions (e.g. higher salinity and lower water regimes). The use of biotechnology to develop plant varieties better adapted to changing Australian climatic conditions should be facilitated.

# Strategies *continued*

## Strategy 7 | Establish an integrated national approach to plant biosecurity education and awareness

| Limitations of the current system | Vision for 2020 |
|---|---|
| • The communication of complex plant biosecurity messages across a large number of stakeholders (from both government and industry) can reduce the effectiveness of a nationally coordinated integrated response<br>• University and tertiary education programs driven by student demand and resource availability | • A nationally coordinated education system which is targeted to meet the future and current needs of plant biosecurity |
| • Community messaging concentrated on stakeholder groups that can conveniently be contacted and delivery of messages that don't necessarily extend across the plant biosecurity continuum | • An integrated national approach to plant biosecurity communication between all key stakeholders that enables the communication of biosecurity messages coherently and accurately across the sector<br>• Community engagement strategies and infrastructure in place that enables feedback and follow up to be provided to community participants, delivering wider community engagement and valuable plant biosecurity information |
| • Provision of biosecurity information and messages cannot be targeted at specific enterprises, resulting in more generic biosecurity communication, limiting opportunity for specific behavioural responses | • The identification and characterisation of small and large agricultural enterprises that facilitates the efficient communication of plant biosecurity messages with all producers |

A proactive plant biosecurity system based upon shared responsibilities relies on active participation across Australia. Those on the ground are often the best placed to detect and respond to a biosecurity threat.

Fundamental to the operation of a national plant biosecurity system is the need to communicate biosecurity messages coherently and accurately across sectors. After defining the required biosecurity outcomes, messages tailored to the needs of government, producers and the wider community need to be coordinated and delivered consistently across the plant biosecurity continuum.

Larger farming enterprises and smaller farms are widely dispersed in Australia. If key plant biosecurity messages are not adequately communicated across all farming enterprises, there is the potential that some sectors could present a significant biosecurity risk to the pest status of the industry, region or country, as only minimal biosecurity practices may be adopted.

There is an increasing understanding by many governments of the role of non-government stakeholders (including industry and the public) in effectively implementing plant biosecurity strategies and activities. This can be seen through activities such as the Weed Spotters network, as well as various national emergency response programs dependent on community engagement, such as the national tramp ant programs which are underway in Queensland.

## Recommendation 12:

**Develop an integrated national approach to plant biosecurity communication between all key stakeholders***

There is a need for effective and well targeted national coordination of media management, including public awareness strategies.

Producers can often be inundated with messages from many different areas, which may lead to vital plant biosecurity messages being ignored due to information overload. There needs to be a greater coordination of communication within and outside of the plant biosecurity sector when delivering information to producers. One of the issues recognised by social scientists in this area is the need to have stakeholders recognise their role and the impact of their behaviour in this space.

*See also Recommendation 15

### *Action 12.1 Use IBPs and other relevant documents as a base to establish and develop specific sectoral awareness packages*

IBPs are developed by each industry in conjunction with PHA, to identify potential exotic plant pest threats and outline risk mitigation activities that should be put in place. These plans should be used to guide the development of information and awareness packages that can be tailored for sectoral and grower groups.

### *Action 12.2 When developing plant biosecurity operational and extension plans, ensure specific stakeholder needs are taken into account*

The diversity of agricultural and horticultural enterprises must be recognised in communication campaigns. The needs of the separate sectors of the community should be met in tailored campaigns, including those of producers, home gardeners, personnel within the food product supply chain, small landholders and managers of public parks and gardens. Although separate, they should be considered to deliver consistent messages on a national basis.

For example, small rural landholders, typically farming small landholdings up to several hundred hectares, are often new to farming and may have few agricultural skills. Generally, they do not have any plant biosecurity measures in place and have limited awareness of the potential for pest outbreaks. Similarly, overseas seasonal workers and backpackers (sometimes with limited English communication skills), may have little understanding of biosecurity or its importance in protecting Australia's agricultural industries. Retirees are also a highly mobile group who travel around Australia for extended periods.

All these groups have the potential to carry pests from one property to the next on footwear, clothing, vehicles and equipment. Being highly mobile these groups could contribute significantly to the spread of pests. It is therefore vital that plant biosecurity measures are communicated effectively to these groups.

### *Action 12.3 Through the National Communications Network (NCN) develop a National Biosecurity Communication Strategy*

The NCN was established by the Council of Australian Governments (COAG) in 2002 to address the risk of poor public communications and inconsistent public messages during emergency pest incidents. It brings together government biosecurity communication managers and industry, primarily through Animal Health Australia (AHA) and PHA to facilitate cooperation on biosecurity threat preparedness and response activities across animal, plant and marine sectors.

# Strategies *continued*

The NCN is seemingly well placed to design a better integrated national approach to biosecurity communication. The NCN's development of a National Biosecurity Communication Strategy will be directed at improving the integration of activities along the biosecurity continuum and across primary industry sectors. Improved integration will enable resource and information sharing between governments, coordinate government and industry involvement in biosecurity risk mitigation communication, ensure adequate response capability and more effective engagement of the broader community in pest incursion prevention and response measures.

**Recommendation 13:**

**Processes need to be defined that identify, engage, evaluate and sustain community engagement and capture plant biosecurity information**

***Action 13.1*** ***Community engagement strategies should be supported with infrastructure that enables feedback and follow up to be provided to community participants, delivering wider community engagement and valuable plant biosecurity information***

Farm and community based plant biosecurity programs have demonstrated the importance of voluntary surveillance, detection and notification of plant pests. However, community participation requires the allocation of sufficient resources to ensure that follow up, feedback and advice is provided on a continuous professional basis. The lack of sufficient support has been shown to significantly reduce the impact and motivation of community biosecurity programs.

***Action 13.2*** ***Develop processes that support the identification and characterisation of small and large agricultural enterprises in Australia***

The ability to communicate efficiently with all producers involved in commercial agricultural production provides a greater capacity to deliver effective messages that can bring about behavioural change and close gaps in Australia's biosecurity system. A registry of producers (including the land parcels held by individual businesses) would be a useful tool for effectively disseminating information and for supporting communication in the event of an incursion response.

*Image courtesy of PHA*

## Strategy 8 | Develop a national framework for plant biosecurity research

| Limitations of the current system | Vision for 2020 |
|---|---|
| • Research initiatives developed and guided by a wide range of stakeholders, such as the Australian Government, researchers, rural funding agencies, state government priorities and grower organisations | • A national framework for biosecurity research that strengthens, prioritises and coordinates national research capabilities, and which efficiently and cost effectively addresses plant biosecurity continuum and cross sector plant production issues |
| • Research and development prioritisation mechanisms exist within some institutions or within specific plant industry areas, but mechanisms vary and prioritisation does not occur at a national level across all plant industries | • Agreed national strategies in place together with stable funding arrangements for research teams and entities across sectors<br>• Well defined roles for all contributing parties |
| • The current system does not enable succinct identification of national investment in plant biosecurity research and development. The collation and analysis of the data is labour and time intensive | • The identification and prioritisation of key research and development areas in plant biosecurity<br>• Standardised transparent prioritisation processes in place, conducted in a collaborative manner between government and industry and the use of risk and benefit/cost analyses to establish strong business cases for priority research |

A transparent, prioritised research and development program supported by strong business cases will be essential to ensure adequate funding is available and key challenges are met for plant industries over the next ten year period and beyond. To address the research and development challenges facing the plant biosecurity sector, a National Primary Industries Research, Development and Extension (RD&E) Framework is currently under development, with the guidance of the agricultural ministerial council[24].

Effective research and development is essential to underpin plant biosecurity and quarantine arrangements, and to facilitate and maintain sustainable production and market access for Australian plant based industries. Currently, research and development activities are conducted and coordinated by various groups including RDCs (such as Grains Research and Development Corporation (GRDC), Horticulture Australia Limited (HAL), Rural Industries Research and Development Corporation (RIRDC)), CSIRO, CRCs, government agencies, universities, the Commonwealth Environment Research Facilities (CERF) and private organisations.

A new national framework for plant biosecurity research should support and be consistent with the National Primary Industries, RD&E Framework, currently being finalised, which will foster a strong culture of collaboration between governments, research organisations and industry.

# Strategies *continued*

## Recommendation 14:

Establish a national framework for plant biosecurity research

This recommendation would ensure that research duplication is reduced and that benefits and innovation are gained from combined scientific knowledge. It would also facilitate increased exchange of research outcomes with industry. A stable funding mechanism would promote increased development of skills and expertise and ensure existing resources are used in a more efficient manner.

A national framework would help strengthen national research capabilities and enable better management of sector and cross sector issues for primary production. The framework should promote continuous improvement in the investment of national RD&E resources by ensuring that they are applied efficiently, effectively and collaboratively. This will overcome capability gaps, fragmentation and duplication in the national system.

The "national framework" is being designed to provide the biosecurity component of the National Primary Industries RD&E Framework and include environmental and social amenity biosecurity considerations, in addition to primary production.

### *Action 14.1 Conduct a national plant industries research and development stocktake on a regular basis*

A national stocktake of plant industry research capability, capacity and resources is needed to develop investment plans over the ten year period of the NPBS and beyond. This will generate an accurate picture of current resource availability and expenditure. The current combined level of research capability, capacity and funding for plant industries is unknown. However, many gaps in research and development requirements and available funds have been identified.

A set of four broad national biosecurity research and development priorities that identify important under-developed and under-resourced areas of plant biosecurity research are shown in Table 1. An underlying issue common to each of the four priorities is the need for increased plant biosecurity research and development capacity and capability for the environmental and primary production sectors. Projects developed in these priority areas may deliver across more than one priority.

It is envisaged that national plant biosecurity research and development priorities will shift as research is undertaken in areas of high priority and emerging sectors. The national framework should be reviewed regularly to ensure that planning and implementation of research projects remain relevant within the priority areas.

*Image courtesy of hickspixoz.com*

Table 1: Plant biosecurity research and development priorities

| Priority | Objectives |
|---|---|
| **1. Minimise the risk of entry, establishment, or spread of pests** | Develop a knowledge base for assessing and managing the risks of new pests, invasion pathways, and the susceptibility of ecosystems to invasion, in a changing global environment |
| | Enhance detection, surveillance and diagnostic systems |
| | Understand the sociological factors associated with the adoption of risk mitigation measures at the stakeholder level |
| | Develop knowledge and strategies to prevent and contain the spread of invasive species within national borders |
| | Develop tools and decision making frameworks for prevention and eradication of pest species |
| **2. Eradicate, control, or mitigate the impact of established pests** | Understand the movement of invasive species through complex environments |
| | Develop effective and integrated approaches to managing established pests |
| | Improve the understanding of the life history/ecology of pests and the invaded system |
| **3. Understand and quantify the impacts of pests** | Improve understanding of the environmental, economic, and social impacts of pests and management activities |
| | Develop a knowledge base and protocols for managing the invasion risks posed by one sector on others |
| **4. Cost effectively demonstrate the absence of priority quarantine pests** | Develop tools to cost effectively demonstrate the absence of national priority pest species |

### *Action 14.2 Identify and prioritise key research and development areas in plant biosecurity*

There is no national system for prioritising and aligning plant biosecurity research activities and funding in the biosecurity arena, in order to achieve a coordinated and strategic approach. This is especially true where the threat extends across more than one sector or impacts upon the public good. Research and development prioritisation mechanisms exist within some institutions or within specific plant industry areas, but mechanisms vary and prioritisation does not occur at a national level across all plant industries.

There is a need to review existing plant industry research and development programs in order to identify priority areas (current and predicted) and gaps. A standardised transparent prioritisation process conducted in a collaborative manner using risk and benefit/cost analyses is required to establish a strong business case for investment.

There is also a requirement to measure and adequately report on the direction and outcomes of research in plant biosecurity. The availability of nationally collated data would guide future strategic direction and investment decisions.

# Strategies *continued*

## Strategy 9 | Adopt systems and mechanisms for the efficient and effective distribution, communication and uptake of plant biosecurity information

| Limitations of the current system | Vision for 2020 |
|---|---|
| • A wide range of data management systems have been developed and deployed by state and territory governments and industry organisations | • A national plant biosecurity information management framework that facilitates and optimises data sharing |
| • A lack of interoperability between databases and management systems that inhibits data exchange and synthesis of knowledge | • A nationally standardised information system within government and industry that facilitates the collection, analysis and retrieval of surveillance data, the sharing of diagnostic data, and the efficient storage and effective distribution and uptake of research and development outcomes |

The ability to share consistent and accurate information across the plant biosecurity continuum is an essential feature of an advanced and effective plant biosecurity system. To achieve this, a national biosecurity information framework that improves decision making at the regional, state and national levels is required. It will provide access to a wide range of relevant biosecurity information, including diagnostic resources, surveillance data, risk analysis tools and research outcomes, sourced from all states and territories.

A national framework for sharing plant biosecurity information would have the following features:

- Promote collaboration between states and territories and other stakeholders
- Demonstrate high technical interoperability and compatibility
- Exhibit common standards for data and timely reporting
- Provide for consistent data input, recording and dissemination
- Meet privacy, security and legal obligations
- Minimise duplication across systems
- Meet international trade obligations

*Image courtesy of PHA*

## Recommendation 15:

Establish a national plant biosecurity information management framework to optimise data sharing

### *Action 15.1 Develop, implement and maintain standardised information systems nationally, both within government and industry, for the collection, analysis and retrieval of surveillance data.*

Surveillance data, both general and related to emergency responses sourced from surveillance associated with pest incursions and routine surveillance should be recorded within nationally endorsed databases (e.g. BioSIRT) by all state and territory governments. Mechanisms should be established or maintained that allow for summary information from all surveillance data to be recorded. The national surveillance system (see Action 3.2) should also form part of networks, such as the Australian Biosecurity Intelligence Network (ABIN), to enable surveillance information to be collated, analysed and reported.

The national surveillance system should develop key performance indicators (KPIs) and review processes that allow the performance of individual components or the system as a whole to be evaluated. KPIs should include meeting targets for collection of minimum data sets and the development of methods to improve detection of priority pest species. KPIs will also be used to assess benefit/cost considerations associated with surveillance.

### *Action 15.2 Develop a system that enables the sharing of diagnostic data nationally and complete a stocktake of existing data management systems in plant biosecurity laboratories*

It is envisaged that under a NPBDN (see Action 8.1), a national data management system would build on existing systems/tools where possible and practical, and with sufficient capacity and flexibility be able to manage, deliver and link to a variety of information pertinent to plant biosecurity. This would include diagnostic protocols, image libraries, symptom libraries, a DNA register (for reference samples), contingency plans, web based identification tools and guides, and expertise registers.

These would also enhance the capacity to deliver distributional records (including Geographic Information System (GIS) data), biological information and related literature. There will also be links to tools for predictive modelling, spatial analysis, economic assessment, risk assessment and early warning reports.

### *Action 15.3 Develop systems and strategies for efficient storage, effective distribution and uptake of research and development outcomes*

A national repository for plant biosecurity related research data and relevant information needs to be maintained. The repository would have open access and be linked to national biosecurity information infrastructure (e.g. ABIN, the Pest and Disease Image Library (PaDIL)) or an equivalent national information network. Deposition of data in the national information repository should be a mandatory contractual requirement for future research and development funding. Resources to retrieve historical data from research institutions, and to verify and deposit within the national repository, should be allocated.

There is a need for an investigation into the most effective mechanisms to communicate research and development activities, outcomes and outputs. By putting these mechanisms into place, it will ensure that the knowledge generated through research and development is received, understood and adopted in a timely manner by a range of stakeholders. This will ensure that rapid uptake and adoption of research and development to support sustainable production and market access outcomes occurs.

### *Action 15.4 Ensure that existing data systems of relevance to plant biosecurity are linked to future systems*

Currently at the national level, there are a number of new systems for data collation and exchange at various degrees of development (e.g. BioSIRT, ABIN, Atlas of Living Australia (ALA) and PaDIL). These systems should be continued to be developed and expanded over time.

# Strategies *continued*

## Strategy 10 | Monitor the integrity of the plant biosecurity system

| Limitations of the current system | Vision for 2020 |
|---|---|
| • A large number of stakeholders and wide range of pest threats reduce the opportunity to develop a cohesive and detailed perspective/overview of the national plant biosecurity system | • The integrity of the plant biosecurity system is regularly monitored for the benefit of all stakeholders<br>• The outputs of the monitoring are used to improve effectiveness and efficiency of the plant biosecurity system with all parties contributing<br>• Roles and responsibilities of stakeholders are identified and supported, and enhancements to the national plant biosecurity system proposed and adopted |

Through the Australian Government's initial response to the Beale Review[1], a number of high level reforms to Australia's biosecurity system are currently underway at a national level. Although the high level reforms focus on biosecurity responsibilities within government, the NPBS requires that all stakeholders will have nationally recognised roles and responsibilities in the development and operation of an integrated biosecurity system.

With so many stakeholders, opportunities exist for a more coordinated and collaborative approach to be developed. This is particularly important given that most stakeholders are experiencing difficulties in delivering efficient and effective control programs with existing resources. Clarifying the roles and responsibilities of each stakeholder and finding ways of effectively bringing people together is important. There is strong support to facilitate greater collaboration and planning at the national and regional level with landowners, natural resource management groups and local governments.

Currently, there is no single body or mechanism to monitor the integrity of the whole Australian plant biosecurity system. This national overview is essential if a new nationally coordinated plant biosecurity system is to be achieved.

**Recommendation 16:**

**Monitor the integrity of the plant biosecurity system in conjunction with, and on behalf of, all stakeholders, through PHA**

As a not-for-profit, independent company, PHA is in a unique position to facilitate issues and to gather and circulate information on behalf of industry and government. This position is evidenced by PHA's role in developing and distributing the National Plant Health Status Report (NPHSR) and as custodian of the EPPRD.

Regular assessment of surveillance, diagnostic and operational programs as components of Australia's plant biosecurity system is required on a national basis. This assessment should include the identification of gaps in capability and capacity, as well as weaknesses in the overall system. Recommendations on national roles and responsibilities could then be allocated to both industry and government via a collaborative process.

This process would:

- Help ensure that a truly national plant biosecurity system is developed and maintained across the continuum
- Provide the drivers for entities or stakeholders to be adequately resourced to meet the national responsibilities
- Provide a mechanism for active review and reinforcement of the plant biosecurity system

**Recommendation 17:**

**Develop an implementation plan for the delivery of the NPBS in conjunction with, and on behalf of, all stakeholders, through PHA**

The NPBS represents a vision for the future where Australia has an internationally outstanding plant biosecurity system which contributes effectively to Australia's food security, supports sustainable production and provides enhanced domestic and international market access. The purpose of an implementation plan will be to prioritise actions, set timetables and develop action plans that create the environment for stakeholders to bring the NPBS to fruition. The implementation plan will also incorporate a review date for the NPBS. Opportunity exists to facilitate this activity through the resources and networking provided by PHA.

***Action 17.1*** ***A National Plant Biosecurity Strategy Implementation Committee (NPBSIC) be established to develop an action plan that can direct the implementation of the NPBS in accordance with the recommendations and actions presented within the strategy***

It is proposed that an expert NPBSIC be established with members drawn from the governments, industries and the wider community. The NPBSIC will have an independent chair who is a person with appropriate expertise. PHA could serve as its secretariat, and facilitate the development of the implementation plan on a user-pays basis. The purpose of the NPBSIC will be to oversee the development of an action plan (through a process of consultation and consensus), that can be used to guide the effective national adoption of NPBS recommendations and actions.

The action plan will:

- Prioritise NPBS recommendations and actions
- Assist in identifying stakeholder roles and responsibilities in the implementation of the NPBS
- Outline the roadmap of activities and investment required
- Establish timelines
- Assist government, industry and community to prioritise resources and investment
- Facilitate the coordination of activities by stakeholders
- Propose funding sources, mechanisms and pathways
- Communicate and promote awareness of the NPBS to relevant stakeholders and interested parties

# Glossary

## Definitions

### Internationally recognised definitions

| | |
|---|---|
| **Appropriate Level of Protection**[26] | The level of protection deemed appropriate by the Member establishing a sanitary or phytosanitary measure to protect human, animal or plant life or health within its territory. |
| **Pest**[30] | Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products. |
| **Pest free area**[30] | An area in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained. |
| **Pest free place of production**[30] | Place of production in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained for a defined period. |
| **Pest free production site**[30] | A defined portion of a place of production in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained for a defined period and that is managed as a separate unit in the same way as a pest free place of production. |

### Australian definitions

| | |
|---|---|
| **Area freedom** | Absence of a specific pest in a specified location (which may include pest free areas, pest free places of production or pest free production sites). |
| **Biosecurity activities** | Activities undertaken to manage biosecurity risks. |
| **Biosecurity continuum** | Describes the range of locations where biosecurity risks may arise and where biosecurity activities take place – pre-border, at the border and post-border. |
| **Border** | In relation to the biosecurity continuum: airports, seaports and land borders that represent the potential point of entry for a pest into Australia. |
| **Commonwealth** | The Commonwealth of Australia, including its external territories. |
| **Diagnostics** | Processes and standards associated with the accurate identification of a pest. |
| **Disinfestation** | Post-harvest management measures focused on eliminating the presence of pests within plants and plant products. |
| **Domestic quarantine** | Activities designed to prevent the movement and spread of pests within Australia. |
| **Emergency Plant Pest** | A pest that is included in Schedule 13 (of the EPPRD)[7] or which is determined by the Categorisation Group to meet one or more of the following criteria:<br>A. It is a known exotic Plant Pest the economic consequences of an occurrence of which would be economically or otherwise harmful for Australia, and for which it is considered to be in the regional and national interest to be free of the Plant Pest.<br>B. It is a variant form of an established Plant Pest which can be distinguished by appropriate investigative and diagnostic methods and which, if established in Australia, would have a regional and national impact.<br>C. It is a serious Plant Pest of unknown or uncertain origin which may, on the evidence available at the time, be an entirely new Plant Pest or one not listed in Schedule 13 and which if established in Australia is considered likely to have an adverse economic impact regionally and nationally. |

# Glossary

| | |
|---|---|
| **Emergency Plant Pest (continued)** | D. It is a Plant Pest of potential economic importance to the area endangered thereby and not yet present there or widely distributed and being officially controlled, but is occurring in such a fulminant outbreak form, that an emergency response is required to ensure that there is not either a large scale epidemic of regional and national significance or serious loss of market access. |
| **Emergency response** | The actions undertaken to contain and/or eradicate an exotic pest after its detection. |
| **Emergency Weed** | An invasive plant species that meets the EPP criteria as defined by the EPPRD[7]. |
| **Emergency Plant Pest Response Deed** | A pre-agreed cost sharing and response framework for dealing with an incursion of an EPP. |
| **Established pests** | A pest that is perpetuated, for the foreseeable future, within any area and where it is not feasible (whether in terms of technical feasibility or a benefit/cost analysis) to eradicate. |
| **Exotic pests** | Plant pests that do not normally occur in Australia. |
| **High Priority Pest** | A pest that has been identified to have one of the highest potential impacts to a particular plant industry and is listed in an IBP or in Schedule 13 of the EPPRD. An outcome of a prioritisation process. |
| **Phytosanitary measure** | Any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of pests, or to limit the economic impact of regulated pests. |
| **Plant biosecurity** | Plant biosecurity is a set of measures which protect the economy, environment and community from the negative impacts of plant pests. 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 necessary to preserve the Australian environment and way of life. |
| **Plant industries** | Covers agriculture, horticulture, forestry and amenity plants and plant products. |
| **Post-border** | In relation to the biosecurity continuum: region's inside Australia's border. |
| **Pre-border** | In relation to the biosecurity continuum: region's outside Australia's border. |
| **Public good** | Means the community receives significant benefit, regardless of whether that benefit is in the form of an economic benefit, a non-economic benefit, an environmental benefit, or an intangible benefit. |
| **Quarantine** | The system of measures which are used to minimise risks associated with the entry of pests. |
| **Response Plan** | An integrated plan for undertaking a response to an EPP incident. |
| **Risk analysis** | The process of evaluating scientific and economic evidence to determine the risk posed by a pest to Australia's environment, plant industries and economy. |
| **Risk return** | The allocation of resources and efforts to those areas of greatest return from a risk management perspective. |
| **SPS Agreement** | The Agreement on the Application of Sanitary and Phytosanitary Measures of the WTO, to which all WTO member countries are bound. |
| **State and territory governments** | The state and territory governments of Australia. |
| **Surveillance** | Processes which collect and record data on pest occurrence or absence by survey, monitoring or other procedures. |

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# Acronyms and abbreviations

| | |
|---|---|
| **ABIN** | Australian Biosecurity Intelligence Network |
| **ACDA** | Australian Council of Deans of Agriculture |
| **AHA** | Animal Health Australia |
| **ALA** | Atlas of Living Australia |
| **ALOP** | Appropriate Level of Protection |
| **APAS** | Australian Pest Animal Strategy |
| **APVMA** | Australian Pesticides and Veterinary Medicines Authority |
| **ARC** | Australian Research Council |
| **AWS** | Australian Weeds Strategy |
| **BEPWG** | Biosecurity Emergency Preparedness Working Group |
| **BioSIRT** | Biosecurity Surveillance, Incident Response and Tracing |
| **BSG** | Biosecurity Services Group |
| **CERF** | Commonwealth Environment Research Facilities |
| **COAG** | Council of Australian Governments |
| **CRC** | Cooperative Research Centre |
| **CSIRO** | Commonwealth Scientific and Industrial Research Organisation |
| **DAFF** | Department of Agriculture, Fisheries and Forestry |
| **EADRA** | Emergency Animal Disease Response Agreement |
| **EPP** | Emergency Plant Pest |
| **EPPRD** | Emergency Plant Pest Response Deed |
| **GDP** | Gross Domestic Product |
| **GIS** | Geographic Information System |
| **GRDC** | Grains Research and Development Corporation |
| **HACCP** | Hazard Analysis Critical Control Point |
| **HAL** | Horticulture Australia Limited |
| **HPP** | High Priority Pest |
| **IBP** | Industry Biosecurity Plan |
| **IEC** | International Electrotechnical Commission |
| **IGAB** | Inter-Governmental Agreement on Biosecurity |
| **IPM** | Integrated Pest Management |

# Acronyms and abbreviations

| | |
|---|---|
| **IPPC** | International Plant Protection Convention |
| **ISO** | International Organization for Standardization |
| **ISPM** | International Standards for Phytosanitary Measures |
| **KPI** | Key Performance Indicator |
| **MoU** | Memorandum of Understanding |
| **NATA** | National Association of Testing Authorities |
| **NBC** | National Biosecurity Committee |
| **NCN** | National Communications Network |
| **NDP** | National Diagnostic Protocol |
| **NEBRA** | National Environmental Biosecurity Response Agreement |
| **NGIA** | Nursery and Garden Industry Australia |
| **NMG** | National Management Group |
| **NPBDN** | National Plant Biosecurity Diagnostic Network |
| **NPBDS** | National Plant Biosecurity Diagnostic Strategy |
| **NPBS** | National Plant Biosecurity Strategy |
| **NPBSIC** | National Plant Biosecurity Strategy Implementation Committee |
| **NPBSS** | National Plant Biosecurity Surveillance Strategy |
| **NPHSR** | National Plant Health Status Report |
| **NPSRT** | National Plant Surveillance Reporting Tool |
| **NRMMC** | Natural Resource Management Ministerial Council |
| **ORC** | Owner Reimbursement Costs |
| **PaDIL** | Pest and Disease Image Library |
| **PHA** | Plant Health Australia |
| **PIMC** | Primary Industries Ministerial Council |
| **RD&E** | Research, Development and Extension |
| **RDC** | Research and Development Corporation |
| **RIRDC** | Rural Industries Research and Development Corporation |
| **SPS** | Sanitary and Phytosanitary |
| **WTO** | World Trade Organization |

**Plant Health Australia**
Suite 5, FECCA House
4 Phipps Close
DEAKIN ACT 2600

Phone: +61 2 6215 7700
Email: admin@phau.com.au
**www.planthealthaustralia.com.au**

Plant Health AUSTRALIA

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