

Research for Action biosecurity

Research for Action 2009-2013

Introduction

Biosecurity can be defined as the protection of the NSW economy, environment and human health from the negative impacts of diseases, pests and weeds. It also includes the management of invasive species, if they become established. Maintaining biosecurity is a key challenge for governments worldwide as human and animal populations increase, and food and fibre production systems intensify. With increased international travel and trade, there is an increased capacity for people, livestock, plants and primary products to inadvertently introduce and spread pests and diseases.

Impacts of biosecurity incursions and endemic pest problems, such as costs of control measures and losses of production and economic activity, are high. However the benefits of maintaining Australia and NSW's high biosecurity status are considerable. The effective protection from and management of biosecurity-related challenges improves productivity, protects market access, preserves Australia's unique environment and biodiversity and protects human health. Many of these benefits reflect the return on past R&D investments in strategic and cost-effective pest or disease control, eradication or exclusion programs.

Some challenges are global, such as the possibility of pandemic influenza developing from an animal influenza strain, or the spread of virulent cereal rusts which threaten food security. Others are local, such as an incursion of new aquatic weeds in NSW waterways or the potential spread of exotic disease from feral to domestic animals.

Industry & Investment NSW's (I&I NSW) commitment to the management of biosecurity threats is given in the Department's Biosecurity Strategy and its associated NSW Invasive Species Plan. The strategy describes the key actions needed to achieve outcomes that are measured by their success in preventing the entry of biosecurity threats to NSW, in containing and eradicating threats prior to their establishment, and in minimising the impacts of biosecurity problems. These are underpinned by the need for strong collaborative linkages within



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I&I NSW, across Government and with other stakeholders, and by the need to maintain NSW I&I's capacity to respond to and manage biosecurity threats in NSW.

These outcomes also clearly depend upon an effective and responsive research capability that provides:

- Underpinning science to inform risk analyses and policy development such as IRAs for imported products
- Tactical R&D that enables preparedness for and rapid response to immediate biosecurity challenges. This includes development of new diagnostic techniques and integrated pest and disease management systems, and the conduct of surveillance programs.
- Strategic R&D that anticipates and monitors future and emerging biosecurity challenges. This includes bioeconomic and population modelling and the development of new diagnostic capabilities for exotic and emerging pests and diseases.

To meet biosecurity challenges and the community's expectations in environmental protection, food safety, animal welfare and human health, Biosecurity Research in I&I NSW must answer these key questions:

- How can we predict, detect and eradicate or manage new biosecurity threats from animal and plant diseases and pests, invasive animals and weeds in NSW?

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- How can we improve our capacity to mount rapid and effective responses to biosecurity incursions before they become established?
- How can we effectively manage ongoing endemic biosecurity problems cooperatively with industries, the community and other agencies to minimise their impacts on human, animal and plant health, productivity and food safety?
- How can we develop cost-effective integrated management systems that protect market access and reduce reliance on chemical use?
- How can we continue to improve the efficacy of surveillance regimes across Australia?
- How do we benchmark the success of our biosecurity R&D?
- How do we maintain the research capability to ensure an effective response capacity to biosecurity challenges?

There are clear, mutual dependencies between biosecurity research and the biosecurity response capacity of the Animal and Plant Biosecurity branch of I&I NSW. The biosecurity research theme also overlaps other priority research themes in the Science and Innovation Division of I&I NSW. For example, the development of integrated pest and disease management systems is integral to plant and animal protection and health, and underpins adaptive systems to maintain and enhance productivity and food security. Similarly, research on understanding the interactions of pests and diseases with their hosts, predators and environment will be critical in determining and managing impacts imposed by climate change and water availability.

I&I NSW's biosecurity research deals with threats to both animal and plant industries, including the impacts of vertebrate pests and weeds. This research capacity is underpinned by world class diagnostic laboratory facilities, and expertise in modelling, ecology, taxonomy, economics and biometry.

I&I NSW houses scientific reference collections of insects, mites, plants and micro-organisms that are under legislative protection. It also retains formal collaborative linkages with other biosecurity research

providers to meet its science and community objectives in biosecurity research. This includes the partnership with Sydney University in the NSW Centre for Animal and Plant Biosecurity and membership of the Invasive Animals CRC, Biosecurity CRC for Emerging Infectious Diseases and CRC for National Plant Biosecurity.

A National Biosecurity Framework

Biosecurity activities in NSW are carried out within a national framework because pests and diseases have no respect for State borders. For example AUSVETPLAN provides a stakeholder funded national framework for response to outbreaks of exotic animal diseases managed through Animal Health Australia. A similar model has been applied through Plant Health Australia for the development of PLANTPLAN. NSW Biosecurity Research feeds into both of the emergency response models.

More recently AUSBIOSEC has been established to better integrate the management of both plant and animal biosecurity and invasive species. AUSBIOSEC applies to risks of invasive species across the biosecurity continuum and builds on specific industry and pest based strategies.

The National Biosecurity Committee is developing the National Strategic Framework for Biosecurity R&D. This will provide a national approach to prioritising and aligning biosecurity research. It identifies a set of high-level national priorities and provides a mechanism to increase national coordination, collaboration and capability for biosecurity R&D. The Biosecurity Research objectives of I&I NSW align with these priorities.

Also under development is the Australian Biosecurity Intelligence Network (ABIN) under the auspices of the National Collaborative Research Infrastructure Scheme (NCRIS). ABIN will provide collaborative information management infrastructure that will enhance connectivity, information access and linkages between individuals and groups nationally. The initiative is in recognition of the vast amount of information generated by disciplines involved in biosecurity R&D and the critical need to share this information effectively during a biosecurity incursion to enable evidence-based decisions.



OUTCOME	
Protection of animal, plant and human health from impacts of biosecurity threats and incursions	
Objectives	Strategies
Prioritisation and detection of exotic biosecurity threats	<ol style="list-style-type: none"> 1. Improve the accuracy of risk assessments and diagnostic tests for key biosecurity threats 2. Provide science-based foundation to surveillance and response programs for key endemic and exotic biosecurity threats 3. Improve access to technical resources and physical or digital collections of pests, disease agents and weeds 4. Develop predictive models for changes in the distribution and impacts of pests, diseases and weeds
Rapid and effective response to incursions or changes in pest distribution	<ol style="list-style-type: none"> 5. Develop and maintain a research capability and capacity to identify, contain and eradicate threats 6. Develop technologies that increase effective options for responses to biosecurity threats and incursions
Management and control and endemic pests, diseases and weeds	<ol style="list-style-type: none"> 7. Develop technologies that deliver improved integrated management systems and long term control or eradication options for pests, diseases and weeds. 8. Develop technologies that reduce reliance on chemical use in primary industries and the risk of antibiotic and pesticide residues 9. Develop methods for the humane control and eradication of invasive vertebrate animals 10. Develop cooperative linkages between I&I NSW and other agencies, industry and the community to manage endemic biosecurity problems
Market access for primary industry products is maintained, regained and / or developed	<ol style="list-style-type: none"> 11. Deliver R&D that demonstrates the confirmation and maintenance of area freedom 12. Develop technologies to reduce or eliminate pests, diseases and chemicals from traded products to meet market access specifications

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