Improving national plant biosecurity surveillance

Australian Government
Department of Agriculture, Fisheries and Forestry

Plant Health AUSTRALIA

The project to investigate a Nationally Integrated Surveillance System for plant pests is led by Plant Health Australia, and funded by the Department of Agriculture, Fisheries and Forestry to identify options for the improved delivery and resourcing of plant biosecurity surveillance into the future.

Acknowledgement of Country

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

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Table of Contents

The value of plant pest surveillance

Plant pest surveillance provides information on the presence or absence of plant pests (any invertebrate or pathogen harmful to plants, plant products or bees). Surveillance delivers value to governments, communities, growers and the supply chains that rely on plant or bee products and pollination services, by:

- providing data to support domestic and international market access
- improving our chances of eradication or containment, saving long term costs of management or lost markets and assisting the protection of food production, our environment and urban green spaces if pests can be detected early and prevented from establishing
- providing baseline data on pest types and levels that can save time and resources when determining how long a pest has been here, or even whether it is a native species.

Spongy moth - prevention is better than the cure

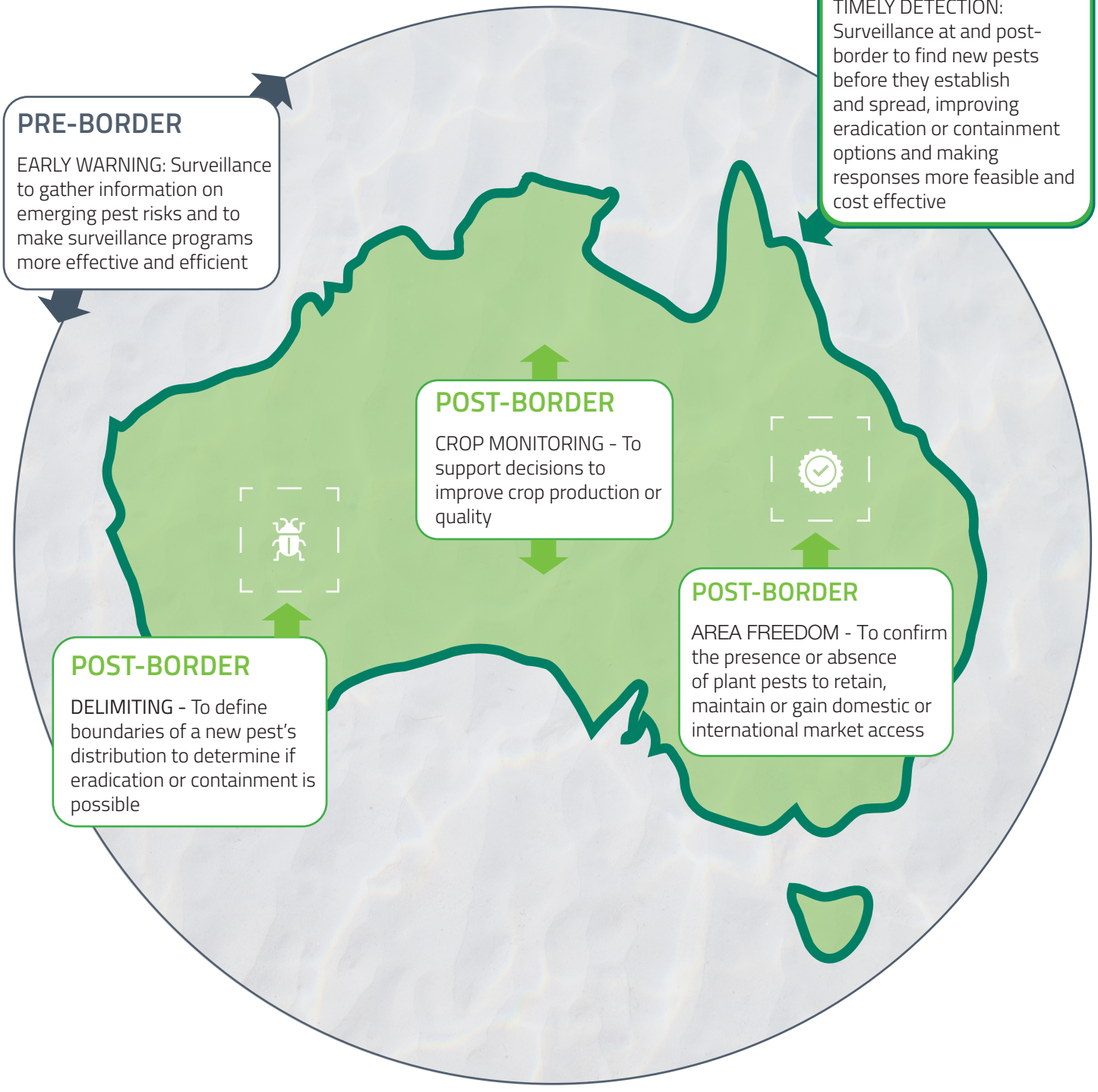
Spongy moths (previously known as Asian gypsy moths) are hitchhiker pests, meaning they can enter Australia attached to cargo and freight, not just with host material. Risk of entry of these pests is based on the time a ship spends at sea and the ports it visits, resulting in a low overall risk of entry into Australia, however a trapping program has been in place at ports for several years at a cost of approximately $500,000 per annum.

The purpose of this surveillance is timely detection to find incursions early enough to be technically feasible to eradicate. Establishment of spongy moths would cause problems for farmers, foresters and our natural environment, with an estimated impact of $1.2billion over 20 years (Hafi et al. 2014).

The economic returns of the surveillance program were assessed by Bloomfield and Arthur in 2019, taking into account impact, the low risk of entry of this pest and the cost of a 5 km trapping grid at ports. They concluded the program was a cost-effective investment that should be maintained and continually reviewed to ensure it remains fit for purpose.

Image: USDA APHIS PPQ Archive, Image UGA 2652080

The purpose of surveillance for plant pests



Pressures on our biosecurity system

There have always been pressures on our ability to resource and deliver biosecurity outcomes, but now more than ever, our system is facing significant challenges. There are many reasons for this, and some of the most important are outlined here.

Number of pests and hosts

There are many tens of thousands of plant pests worldwide, and the biology and diagnostics of even the most important are not always well understood.

Australia has prioritised pests of importance by defining 42 pest groupings (157 pest species) as National Priority Plant Pests (NPPPs), 13 environmental exotic plant pests in the Environmental Exotic Pest List (EPPL), and over 400 High Priority Pests identified by plant industries, some of which are also NPPPs or Environmental Exotic Pests (EEPs). Plant hosts are also extremely diverse, stretching across all climate types in Australia, with continuous connections between urban and peri-urban to commercial production and the environment. These pest lists need to be continually reviewed as threats change.

Changing pathways

Changes in climate, cropping areas, freight and shipping systems and the increasing proximity of urbanisation near commercial crop production all affect the pathways on which pests are moving around the world and into and within Australia. These changes can be rapid, challenging our ability to maintain current information on risk assessments and ensure our mitigation measures, including surveillance, are appropriate.

Resourcing constraints

There are an average of 40 plant pest incursions each year, placing pressure across government jurisdictions, plant peak industry bodies (PIBs) and Plant Health Australia (PHA), and eroding the ability to undertake activities such as surveillance. Not all plant pest incursions result in responses, but information is needed on all notifications, resulting in consistently high workloads and continual pressure on resources.

Emerging pest threats - Spotted lantern fly

The Spotted lantern fly *(Lycorma delicatura)* is one of many examples of pests that have emerged over the last decade as threats to commercial production.

This pest is native to China and was not considered a pest of concern by other countries until its detection in the United States in Pennsylvania in September 2014.

It is a good hitchhiker and has spread rapidly, prompting social media awareness campaigns in the United States to alert communities of the risk and report new sightings.

Spotted lantern fly has a wide host range, affecting fruit, ornamental and woody trees, causing wilting, leaf curl and production of honey dew, which encourages black sooty mould.

Losses in Pennsylvania alone have been estimated to be at least US$324M each year.

Read more about the potential economic impact of spotted lantern fly in Pennsylvania (psu.edu).

Image: Lawrence Barringer, Bugwood.org

It is not currently on any of Australia's priority pest lists, but is considered under the National Hitchhiker Plant Pest Action Plan 2022-2032 and may be a pest that requires surveillance into the future.

Another pest that has emerged as an issue in recent years is Brown marmorated stink bug *(Halyomorpha halys)*, which has required significant changes to risk mitigation prior to and at the Australian border and surveillance at high-risk sites.

A second pest, Fall army worm *(Spodoptera frugiperda)*, is a strong flyer and has spread throughout the world in less than a decade. It was detected in surveillance traps on the Australian mainland in 2020 and has since spread rapidly.

Surveillance in an integrated system

Surveillance is more than the act of looking for plant pests. An effective surveillance system should be underpinned by collaboration and partnerships and needs:

Diagnostics

Diagnostic assessment is crucial for successful surveillance but can often be the largest bottleneck due to the availability of capacity, resourcing and expertise.

Data capture and analysis

Surveillance should be statistically sound, defensible and evidence based. A well-designed program, built on consistent data capture, collation and analysis will provide outcomes and support continual improvement.

Surveillance delivery

Surveillance requires use of the most appropriate tools, methods and techniques for different pest targets. Nationally consistent protocols and standards will support delivery of activities that can be adopted and accepted by a range of different stakeholders.

Engagement and communication

Communication programs to improve pest awareness are used to support general surveillance and improve pest reporting. Communication of surveillance program outputs is also critical in highlighting program achievements to support sustainable funding.

Coordination and governance

Coordination and governance prioritises activities and resources, and supports a transparent, collaborative and consistent approach to decision making.

Horizon scanning

Surveillance needs to be responsive and able to adapt to changing environments by assessing emerging pest threats, risks and pathways.

Capability and capacity

Specialist skills are needed for pathway analysis, pest prioritisation, survey design, diagnostics and data analysis. Surveillance teams may need botanists as well as entomologists and pathologists.

Examples of surveillance programs in Australia

There are several types of partnerships that have been implemented for delivering surveillance in Australia, and examples of programs with differing models for resourcing and delivery are outlined below.

Government-led and delivered

The National Plant Health Surveillance Program undertakes surveillance at high-risk sites for a range of pest targets. It operates under a Partnership Arrangement between the Australian government and state and territory governments.

Government/plant industry partnerships

The National Bee Pest Surveillance Program coordinated by Plant Health Australia, undertakes surveillance at ports of highest risk of new bee pests entering and establishing. It is funded by Hort Innovation, the Australian Honey Bee Industry Council and Grain Producers Australia through their biosecurity levies, with delivery and in-kind from state and territory governments through sub-contracts. A second example, the National Forest Pest Surveillance Program also coordinated by Plant Health Australia, began in 2022 and operates under an overarching Collaboration Agreement that outlines the partnership between the plantation timber industry and all governments.

Industry-led

The CitrusWatch program was established in 2021 and undertakes surveillance for early detection of high priority citrus pests across commercial production and in urban and regional centres. It is currently funded by Hort Innovation and the Citrus Australia biosecurity levy.

Regional

The Northern Australia Quarantine Strategy (NAQS) undertakes surveillance for plant and animal pests and diseases across the northern Australia border. It has been running for over 20 years and is led and delivered by the Australian government, with strong links to Western Australian, Queensland and Northern Territory governments.

Activity based

The Significant Disease Investigation Program (SDI) operates nationally to provide subsidies for veterinarians and laboratory costs to investigate significant, unusual disease symptoms in livestock.

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