

# Evaluation Report Series

## Evaluation Report 9

Review of Plant Health

August 2005  
Biosecurity Victoria



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# Foreword

In 2002-03, the Victorian Government conducted a review of the State's *plant health* function managed by the Victorian Department of Primary Industries (DPI). The review focussed on the role of government in the provision of services. While centred on Victoria, the review is relevant to the future management of plant health programs in all jurisdictions, particularly given that many such programs are coordinated at a national level.

Both the review and this report, which outlines the review findings, were prepared under the direction of Gary Stoneham, Chief Economist, DPI Economics and Policy Research Branch and Terry Truscott, then Director, DPI Agricultural Industry Policy Branch. Senior staff in the Agricultural Quality Assurance Branch (now Biosecurity Victoria) assisted the review.

Because the material outlined in this report was prepared during 2002, it may not reflect some of the more recent initiatives and decisions by the Commonwealth, States and industry. For example, in May 2003, the Victorian Government announced additional funding of \$23.1 million over four years for enhanced biosecurity and market access measures. In May 2005, the Victorian Government announced that \$8.4 million would be provided over four years to deal with plant biosecurity threats in regional Victoria.

While some minor changes have been made to increase clarity, such as updating the names of government agencies, the report in all other respects is an accurate record of the review at the time it was undertaken.

**Peter J. Bailey**

Executive Director, Biosecurity Victoria  
Department of Primary Industries

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## Executive Summary

|  |   |
|--|---|
| <i>Plant production systems make up a large part of the Victorian rural economy.</i>       | At farm level, plant production in Victoria is worth around \$2.9 billion in 1999/2000, or 44 per cent of the gross value of agricultural production in Victoria.   |
| <i>Beneficiaries of plant health investment include:</i>                                   | Investment in plant health generates benefits to affected producers, other plant growers and in some instances to society as a whole.   |
| <ul style="list-style-type: none"> <li>▪ <i>growers of affected plants</i></li> </ul>      | By controlling plant pests and diseases, producers of affected plants benefit through improved plant productivity (reduced losses) and improved access to markets.  |
| <ul style="list-style-type: none"> <li>▪ <i>other growers of plants</i></li> </ul>         | Other plant growers and plant industries benefit through reduced spread of diseases and improved access to markets.   |
| <ul style="list-style-type: none"> <li>▪ <i>society</i></li> </ul>                         | Society as a whole benefits from reduced spread of plant diseases to native flora with flow-on effects to native fauna; less disruption to other sectors, such as tourism and transport; and improved food security and lower chemical usage.   |
| <i>Growers have incentives to invest in plant health.</i>                                  | Most plant health investments are made by growers. In 2000, growers in Victoria spent \$165 million on chemicals (including weedicides) for plant health.   |
| <i>Government has a role in the provision of some plant health services because of:</i>    | This output review identified the following reasons for government involvement:   |
| <ul style="list-style-type: none"> <li>▪ <i>Economies of scope</i></li> </ul>              | <ul style="list-style-type: none"> <li>• Government provision (not necessarily funding) of emergency plant health responses is appropriate where the overall cost of the service can be reduced because there are economies of scope. It would be costly for each plant industry (grains, apples, pears, etc.) to separately develop and maintain the skills and resources needed.</li> </ul> |
| <ul style="list-style-type: none"> <li>▪ <i>Environmental and human impacts</i></li> </ul> | <ul style="list-style-type: none"> <li>• Some plant health investments generate spillover benefits to the community as a whole. Examples include management of plant pests and diseases that can spread to the environment or harm humans.</li> </ul>   |

- *Emergency response capability*
  - In some instances, such as emergencies, legislation and regulations will be required to marshal resources needed to respond to disease threats. This is to enable timely responses and to ensure that individuals take actions that are in the common good but not in the private interest of individual growers.
  
- *International and national obligations.*

Commonwealth and State Governments have a range of obligations including commitments to the World Trade Organisation (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures to protect human, animal and plant life or health.

Government has an important role in the provision (but not necessarily funding) of some plant health services. Many sectors of society benefit from government investment in this area.

## **Emergency plant pest management**

*The output from this component of the Victorian Government's plant health function can be defined as activities to build and maintain Victoria's capacity to monitor, detect and respond to emergency plant pest threats.*

The review identified several key features of emergency plant pests:

- *Emergency plant pests impose large costs on the economy.*

The large economic costs associated with serious (emergency) incursions of plant pests include costs associated with loss of markets, direct costs of disease control and costs incurred by other sectors such as tourism and transport. For example, the benefits to the community of controlling red imported fire ants are conservatively estimated to be \$2.2 billion in present value terms.
  
- *Emergency plant pest outbreaks are episodic.*

Outbreaks are episodic and the risk of an outbreak cannot be known with certainty. Even if the probability of an outbreak is low, the potential cost will be large.
  
- *Different control strategies are possible, but have cost implications.*

The cost of disease control varies with different actions and their effectiveness. Eradication and control measures must be carefully assessed to find the most cost-effective solution. It is important to understand the mechanisms by which the disease can spread.

- *The longer an outbreak lasts, the more expensive it is.* If the duration of a disease outbreak can be reduced, the cost to the economy will be smaller.
- *Containing an outbreak to a zone or region reduces the impact.* The extent of the exclusion zone is important. If trade partners allow zones that are free of disease to export, the overall impact is reduced.
- *Quick detection of an outbreak is important.* If disease outbreaks can be quickly detected, the costs of control will be lower.
- *National arrangements exist for responding to emergency plant pest outbreaks.* Australia's responses to exotic plant health outbreaks are managed through a Consultative Committee on Exotic Plant Pests and Diseases (CCEPPD) established for each incursion. The committee includes technical representatives from Commonwealth and state governments and from Plant Health Australia (PHA).

*Plant Health Australia, a not-for-profit public company funded by Commonwealth and state governments and industry, negotiates cost-sharing agreements.*

Plant Health Australia is seeking to establish new pre-arranged cost-sharing agreements between Commonwealth and state governments and industry bodies to cover responses to emergency plant pests in Australia. Current cost-sharing arrangements set up some years ago by Primary Industries Standing Committee involve the Commonwealth and states/territories but not industry bodies. All Australian jurisdictions are to ratify the Emergency Plant Pest Response Deed. The deed specifies the ratio of government/industry contributions for emergency pest eradication and owner reimbursement according to whether they are beneficiaries.

*Current Primary Industries Standing Committee (PISC) funding arrangements for emergency plant pests encourage:*

- *Timely responses to emergency plant pest outbreaks* The funding arrangements enable a rapid response by governments. A quick response reduces the spread of the disease, lowers the cost of eliminating threats and minimises disruption to trade. The Emergency Plant Pest Response Deed, which provides a mechanism for owner reimbursement costs, will overcome the present strong disincentive to quickly report suspected emergency pests.

- *Cost-effective strategies arising from the use of benefit-cost analyses for each disease outbreak.* The approach works well, but the time taken to assess each new outbreak could be further reduced by developing and maintaining models for timely use. Such models would incorporate epidemiological and economic information.
  
- Greater industry involvement in and funding of emergency plant pest programs would encourage more cost-effective investment.* Industry is a major beneficiary of emergency plant pest preparedness, management and control programs yet does not contribute any funding. This means that government expenditure is higher than can be justified. Ratification of the Emergency Plant Pest Response Deed will encourage cost-effective investment.
  
- A requirement for ratification of the Emergency Plant Pest Response Deed is that compensation can be paid to producers affected by emergency plant pests.* The lack of compensation in the past has discouraged growers from immediately reporting plant pests and diseases. This is because these growers will incur economic losses if plants/crops are destroyed and trade is suspended. To encourage early reporting and co-operation, the Emergency Plant Pest Response Deed will make compensation available.
  
- A property identification scheme is needed for efficient surveillance, monitoring and containment programs.* Victoria should investigate the possible development of a grower/property registration scheme for rapid communication and response. This would assist traceback efforts for disease problems.
  
- Diagnostic services are vital for the early detection of emergency plant pests.* Victoria should ensure that there is continued investment in reference collections (which assist rapid identification and action) and scientific expertise and technology to enable a rapid response to potential emergency plant pest outbreaks.
  
- Skills in epidemiology, science and economics are important in devising response strategies.* Skills in a range of disciplines are required if effective, economic programs are to be developed.
  
- Surveys for disease status are vital for rapidly responding to incursions and proving disease freedom.* Adequate resources need to be available for this task. Increasingly it is necessary to prove disease freedom for trade purposes. The groups and individuals who benefit from this work will depend on the nature of the disease and the purpose of the survey.

## **Pests and diseases endemic in Australia**

*The output from this component of the Victorian Government's plant health function can be defined as activities to build and maintain Victoria's capacity to monitor, detect, respond and manage emergency plant pest threats for Victoria.*

*Some emergency plant pests are not in Victoria but endemic in other parts of Australia.*

Emergency pests not found in Victoria (but endemic elsewhere in Australia) have the potential to affect all plant sectors, including forests, amenity gardens and agriculture. This review identified several key features of endemic plant pests of concern:

*These are of concern to Victoria because they impose significant economic costs.*

- Emergency plant pests not in Victoria impose costs on producers, community and the environment. These costs vary with the prevalence, impact on plant performance, rate of spread and potential for spread. Major emergency plant pests found elsewhere in Australia include Queensland fruit fly, red imported fire ants and branched broomrape.

*A strategy is needed to identify the most efficient approach for each disease.*

- A transparent framework containing a checklist of key issues would ensure a consistent approach. Key issues would include impacts of threat, options for control, beneficiaries of the program, cost-benefit analysis and funding arrangements.

*Industry in Victoria should contribute to programs where they are a beneficiary.*

- As with the national situation for emergency plant pest control, it would make sense for industry to contribute to surveillance, monitoring and response activities in Victoria. Management arrangements would follow those used for emergency plant pests at the national level.

*Some pests and diseases require a multi-state approach.*

Victoria, NSW and South Australia fund the TriState Fruit Fly Strategy (TFFS). Designed to restrict the spread of Queensland fruit fly, this major program costs around \$6 million a year.

- *Industry is a major beneficiary of the TriState Fruit Fly Strategy yet contributes very little to the cost.*

The Agreement for this program is currently being re-negotiated with industry. Primary Industries Standing Committee (PISC) at its August 2002 meeting indicated that industry will have to contribute substantially more to any future program. This may be resolved after the ratification of the EPPRD, although industry have indicated that they would not pay more and Queensland Fruit Fly is not presently covered by the EPPRD.

**Pests and diseases  
endemic to Victoria  
but not occurring in  
other states**

*Examples of pests that fall  
under this category are  
phylloxera and potato cyst  
nematode.*

The beneficiaries of DPI services are the industries concerned. DPI recovers a proportion of the cost of the services it provides. This arrangement should continue and the proportion increased over time.

**Pests and diseases  
endemic to Victoria  
and Australia**

*Pests in this category  
include western flower  
thrips and prescribed pests  
under legislation.*

In these cases, efforts usually focus on controlling spread or even doing nothing if the impact is not significant. In Victoria, industry is the main source of funds for work to address pests and diseases endemic to Australia.

# 1. Background

At a policy level, there are many similarities between plant health and animal health, with the main differences relating to the structure of the industries and the characteristics of specific diseases and pests. At a project level, however, there are marked differences in the skills and resources required and in the nature of the work. Accordingly, some readers may wish to read this report in conjunction with DPI (2005) "Review of Animal Health", *Evaluation Report 8*.

## 1.1 What is Plant Health?

In this report, the term 'plant health' refers to work directed at combating pests and diseases in plant industries. A plant pest can be any species, strain or biotype of a plant, an animal or a pathogenic agent injurious to plants (ADAS Consulting Limited and Imperial College, 2001). For example, this includes:

- insect pests such as red imported fire ants (RIFA) and grapevine phylloxera.
- nematodes such as potato cyst nematode
- parasitic weeds such as branched broomrape
- plant diseases caused by fungi, viruses or bacteria (e.g., fire blight).

In Victoria, plant production and animal production systems are of similar economic importance. At the farm level in 1999/2000, the state's plant industries produced products valued at around \$3.0 billion, representing 44 per cent of the total value of agricultural production (ABS, 2000). Table 1 shows the value of production and number of farms engaged in the plant industries.

*Table 1: Summary of Victorian plant-based agriculture, 1999/2000*

| Industry Category         | Gross Value of Agricultural Production (GVAP) (\$ million) | Number of producers |
|---------------------------|--|---------------------|
| Cereal grains             | 823  | 8555                |
| Vegetables                | 542  | 1298                |
| Fruit                     | 426  | NA                  |
| All grapes                | 333  | 2522                |
| Pastures and grasses      | 253  | NA                  |
| Nurseries, flowers & turf | 217  | 783                 |
| Pulses                    | 143  | NA                  |
| Oilseeds                  | 138  | 2219                |
| Other                     | 122  | NA                  |
| <b>TOTAL</b>              | <b>2997</b>  | <b>NA</b>           |

\*In 1999/2000 there were a total of 37,304 farms in Victoria (ABS 2000); NA= not available.

Plant pests and diseases impose costs on the economy through their impact on market access and on the productivity of affected agricultural industries.

Victoria and other Australian states have a reputation for being 'clean green' suppliers, which enables access to world markets and, in some cases, price premiums. This image is also important for Victoria's ongoing access to interstate markets that have similar requirements. Continued access to these markets requires pro-active efforts to maintain and to prove Victoria's existing disease-free status. Failure to support this status will result in large costs to the economy.

Pests and diseases also reduce yields, leading to increased production costs as each unit of product requires more land, labour and capital. Alternatively, mitigating against the impact of pests and diseases can involve extra costs from treatments (e.g. sprays), if these are available. Additional chemical usage also leads to residues in products and in the environment.

## 1.2 Beneficiaries of Plant Health Investments

The beneficiaries of pest and disease programs can be considered in three categories: growers, industries and the community.

**Grower benefits:** Growers have an incentive to invest to address plant health on-farm where the benefits exceed the costs. As with animal health, it is difficult to estimate total expenditure by growers on plant health. One indication is grower spending on chemicals used for the control of plant pests and diseases. In 2000, this amounted to \$1329 million and \$165 million in Australia and Victoria respectively, including weedicides (ABS, 2000). However, these figures do not account for extra labour, crop management operations, yield reductions or foregone investment.

**Industry benefits:** Plant industries (including exporters of plant products) benefit collectively from investment in plant health through reduced spread of plant pests and diseases and through protection of market access that could be subjected to disease-related trade restrictions. For example, countries representing 43 per cent of Australia's \$4.7 billion in wheat exports include branched broomrape on their prohibited list (Milne, 2000). No compulsory levies are currently collected for plant health activities at the state or national level. However, industry contributes voluntarily through Plant Health Australia for research and development activities and some other programs.

A key difference between animal and plant health is the structure of the industries involved. Livestock agriculture is made up of a small number of large industries. Victorian plant-based agriculture is made up of a large number of smaller industries (Table 1). For example, the figure for 'fruit' consists of around 16 different crops and the 'vegetables' figure includes 32 crops. Furthermore, there are many more plant pests and diseases than animal pests and diseases. Many of these pests and diseases affect many different crops, often to differing extents. Finally, the more complex marketing arrangements that exist in the plant industries pose a

challenge to collecting levies. In combination, these four factors create a challenging environment in which to develop structures and policies for managing plant health issues.

**Community benefits:** Some investments in plant health can generate benefits for the community in general. These include:

- ***Environment***—Plant diseases and pests can affect native flora with flow-on effects to native fauna, which are valued by members of the community. For example, the incursion of red imported fire ants (RIFA) (see Box 1, page 13) is predicted to dramatically change the composition of animals and plants in affected regions. This could lead to the loss of whole classes of native fauna.
- ***Public amenities and private gardens***—Many horticultural industry plants are also used by residents in their gardens, for example fruit trees. Plant health is also of concern in the management of public parks, gardens and sporting and recreational infrastructure (e.g. golf courses).
- ***Disruption to other sectors***—The existence of some plant pests and diseases can disrupt transport and tourism. For example, the outbreak of red imported fire ants in Brisbane has led to restrictions on the movement of products in the affected area. Fruit fly and phylloxera zones limit the ability of members of the community to transport fruit or vine material between zones, affecting their shopping and recreational activities.
- ***Human health***—Some plant pests, such as red imported fire ants, can also affect human health. Unlike animal health, where some diseases can be transmitted to humans (known as zoonoses), human health is not generally an issue for plant industries. However, mycotoxins that cause human cancers can be produced by certain fungi on some plant materials, e.g. peanuts and maize.

### **Box 1: A Major Exotic Threat: Red Imported Fire Ants**

Originally from South America, red imported fire ants (RIFA) are a very aggressive ant pest with a range of impacts.

RIFA were first detected in Australia in February 2001 in Brisbane. By May 2002, surveillance showed that the outbreak consisted of two main infestations. Since 2002, further active and passive surveillance has shown extended the known area of infestations. However no infestations are known to occur more than 5 km from the declared infested zones. If the current eradication program continues at the same level, it appears to have a very high chance of eradicating RIFA. Currently there are 460 full-time staff dedicated to the eradication in Queensland, although this will fall as the program is wound down following the agreed stages. In 2001, the Standing Committee for Agriculture and Resource Management (SCARM) endorsed spending for eradication efforts over five years, in a cost-sharing arrangement with Victoria contributing 13 per cent. In April 2005, the Natural Resources Ministerial Council (NRMC) approved continuation of the eradication program.

RIFA were discovered at Dandenong in 2001 in a shipment of nursery material from Queensland. RIFA was also discovered at Tullamarine in a shipping container from the USA. Eradication was implemented in both cases and appears to have been successful, but has highlighted the need for continued vigilance. The key areas of impact of an incursion of RIFA can be observed from American experience, where losses from an infestation in the United States have been estimated at \$US 2.77 billion annually (Thompson et al., 1995).

RIFA have been responsible for:

- Damage to houses
- Losses to livestock industries, horticulture and other agriculture: for example, attacks on newborn animals, reduced plant germination, blockage of irrigation systems, disruption to practices such as haymaking (as a result of ant mounding)
- Human health problems: bites require medical treatment and patients require time off work. Bites may also result in blisters and allergic reactions, which can lead to death in some individuals
- Damage to public and urban infrastructure: such as electrical and telecommunications equipment, roads (potholing), gardens, schools, sporting and recreational infrastructure, and other outdoor facilities such as golf courses
- Impact on tourism: several environmental park recreation grounds in the US have been forced to close
- Environmental impacts: some endangered species have been affected by changes in floral balance and reduced numbers of certain vertebrate and invertebrate fauna. It has been predicted (see: <http://www.dpi.qld.gov.au/fireants/8062.html>) that the spread of RIFA throughout Australia could eliminate whole classes of fauna in some areas.

Kompas and Che (2001) have analysed the benefits of eradicating RIFA in Australia. Based on a 30-year investment horizon, the most likely scenario was a \$2.2 billion net present value, with a benefit: cost ratio between 30:1 and 48:1. This was based on an initial eradication cost of \$45 million. The final program endorsed by NRMC in April 2005 was increased to \$145 million to take into account the key costs noted above—excluding tourism and environmental impacts, which the authors noted as being perhaps the most important costs.

### 1.3 Benefits and Costs of Plant Health Programs

The benefits of controlling a plant pest or disease varies with the nature of the disease, particularly in terms of whether it affects trade, productivity or the environment, and the number of industries affected. Table 2 lists some estimates of the benefits and costs of controlling plant pests and diseases. These data support the premise that establishing the capability to rapidly respond to exotic pest and disease incursions is a good investment, as is having good quarantine to prevent incursions in the first place. Eradication and control activities mounted in response to an incursion are also a good investment where the pest or disease meets at least one of the following criteria (Merriman, 2001). High threat to commercial agriculture (e.g. fire blight)

- high threat to amenity flora or environmental ecosystems (e.g. Dutch elm disease, alligator weed and water hyacinth )
- high threat to human health (e.g. red imported fire ants).

**Table 2: Estimated benefits and costs of plant pest and disease control**

| Pest/disease<br>(relevant location)   | Estimated impact   | Estimated costs of<br>control program                |
|---|--|--|
| Branched broomrape<br>(currently in SA)                                       | Benefit:cost ratio for eradication in different scenarios ranging from 19:1 to 31:1. See Milne, 2000.  | \$7.1 million<br>(government costs only)             |
| Fire blight<br>(prediction for<br>Victoria and<br>Australia)                  | <u>Nationally</u> : would bankrupt one in three pear/apple growers and reduce returns to apple and pear growers by 25% and 40% respectively.<br><u>Goulburn Valley</u> : \$20 million loss in farm income (55-60% long-term). Loss of 300 permanent and 3500 casual jobs (plus 1285 in associated industries). Reduced cannery intake by 65%. See ABARE, 1995. |  |
| Papaya fruit fly<br>(Queensland outbreak<br>in 1995)                          | \$74 million through loss of market access and costs of chemical eradication and product disinfestation. See ABARE, 1995.  | \$34 million (plus compensation)                     |
| Tri-State Fruit Fly<br>Strategy (ongoing<br>NSW, SA, Victoria)                | Minimum of \$14.9 million per year due to loss of market access and reduction in productivity. Other benefits not quantified: regional economic benefits, supply chain industry benefits, reduction in chemical usage and residue problems. See PricewaterhouseCoopers, 2001.  | \$6 million a year                                   |
| Red imported fire ants<br>(Queensland outbreak<br>currently under<br>control) | Benefit:cost ratio of control 30:1 to 48:1. Net present value of impact \$2.2 billion (\$6.8 billion in nominal terms). See Kompas & Che, 2001.  | Final program provides \$145 million over five years |

Table 3 summarises total expenditure by state, territory and Commonwealth governments under cost-sharing arrangements for exotic plant pest, disease and weed eradication programs from 1995/96 to 1999/00.

**Table 3: Total public expenditure on plant pest, disease and weed eradication**

| Incursion               | 1995/96      | 1996/97       | 1997/98       | 1998/99      | 1999/00      | Total         |
|-------------------------|--------------|---------------|---------------|--------------|--------------|---------------|
|                         | \$ '000      | \$ '000       | \$ '000       | \$ '000      | \$ '000      | \$ '000       |
| Papaya/exotic fruit fly | 7550         | 11 718        | 12 224        | 6 966        | 1485         | 39 943        |
| Fire blight             |              |               | 814           | 878          | 508          | 2200          |
| Siam weed               |              |               | 170           | 170          | 310          | 650           |
| Panama disease          |              |               |               | 213          |              | 213           |
| Sugar cane smut         |              |               |               |              | 335          | 335           |
| Asian honey bee         |              |               |               | 115          | 36           | 151           |
| Branched broomrape      |              |               |               |              | 689          | 689           |
| <b>TOTAL</b>            | <b>7 550</b> | <b>11 718</b> | <b>13 208</b> | <b>8 342</b> | <b>3 363</b> | <b>44 181</b> |

Source: Plant Health Australia (2001).

## 1.4 The Role of Government in Plant Health

Organisations in the plant industries make substantial investments in the health of their plant species. However, as individual businesses, they are likely to under-invest in plant health because some of the benefits spill over to other plant producers or to the community in general. Specifically, markets will fail to attract enough investment in plant health because of:

- **External disease control costs**—because diseases spread, the disease status of one farm will influence the production costs of other plant-based farms
- **External costs of market access**—the disease status of one farm may influence access to markets for other farms
- **External human health costs**—some plant pests such as red imported fire ants can cause pain and suffering to humans
- **External costs to other sectors of the economy**—outbreaks of some emergency plant pests can disrupt the tourism and transport sectors.

Some form of intervention will therefore be required to increase the investment in plant health above that allocated by individual growers. Industry- or sector-wide measures appear to provide a useful level of aggregation at which to fund additional investment in plant health since many of the external costs are confined to one plant industry or the plant sector as a whole. Even where there are

community-wide benefits, the sector or individual growers have strong incentives to invest in plant health. However, some government involvement in plant health can be rationalised on the following grounds:

- ***Economies of scope***—Economies of scope exist in the provision of plant health capability because it would be costly for each plant industry (grains, stone fruit, etc.) to separately develop and maintain the infrastructure and skills needed to monitor and respond to disease threats. Economies of scope exist where the same resources are needed for different plant health functions. Management of emergency plant pests and endemic diseases all require the same surveillance and monitoring infrastructure. Government provision (not necessarily funding) of emergency response and plant health infrastructure is appropriate where the overall cost of the service can be reduced because there are economies of scale or scope.
- ***Emergency response capability***—In some instances, legislation and regulations will be required to marshal resources needed to respond to disease threats, to ensure that timely responses are made and to ensure that individuals take actions that are in the common good but which are not in the private interest of individual growers.
- ***International and national obligations***—The Australian and Victorian Governments have committed to a range of obligations under the International Plant Protection Convention. Under the World Trade Organisation, a sanitary and phytosanitary agreement governs measures to protect human, animal and plant health.
- ***Spillover costs and benefits***—These include costs and benefits to the environment, public amenities, private gardens and human health.

## 2. Administration of Plant Health in Victoria

Involvement in plant health has traditionally been the role of state and federal governments. As with animal health, national arrangements in plant health are such that the Australian Quarantine and Inspection Service (AQIS) manages quarantine issues at the national borders (including risk assessments of importing countries), while the states manage post-border pest and disease surveillance and control. States also manage intrastate and interstate plant health certification programs to minimise the spread of pests and diseases harmful to plant industries.

### 2.1 Plant Standards Branch

In Victoria, State plant health functions are managed by the Department of Primary Industries' Plant Standards Branch. Specific Plant Standards Branch activities include:

- Maintaining survey and detection programs for emergency plant pests and managing eradication programs for exotic organisms detected within the State.
- Performing surveillance programs for specific pests to prove Victoria's disease-free status for the purposes of interstate and international plant health certification.
- Developing and implementing protocols that minimise the impact of plant pests and diseases on Victorian plant industries with the aim of maintaining and expanding domestic and overseas markets.
- Facilitating trade through setting national and interstate plant quarantine policies, standards and operational procedures in cooperation with the Office of the Chief Plant Protection Officer in the Department of Agriculture, Fisheries and Forestry (DAFF), Biosecurity Australia, the Australian Quarantine and Inspection Service (AQIS), interstate counterparts and industry.
- Inspecting and certifying fruit, vegetables, nursery stock and other plant materials moving into, out of and within Victoria to control the spread of pests and diseases.
- Developing flexible quality assurance arrangements to meet customer requirements while aiming to reduce technical and legislative barriers to trade.
- Auditing pest-monitoring programs and certification assurance arrangements, and conducting investigations into breaches of the Plant Health and Plant Products Act and its subordinate regulations.
- Providing a comprehensive information service on local and interstate plant health requirements, quality assurance programs and pest monitoring and eradication procedures.

- Delivering endemic plant disease control programs. This work currently focuses on three diseases: phylloxera (grapevine aphid), potato cyst nematode (PCN) and western flower thrip (WFT). The phylloxera program maintains different pest-status zones to prevent the pest spreading from affected areas to free areas and to enable the interstate export of grapes and grape products. The PCN program seeks to contain the pest to infested properties around the Gembrook, Wandin and Kooweerup areas and hence minimise its impact on the Victorian potato industry. The WFT program aims to prevent the spread of the pest to the Toolangi Plant Protection District.

Other work focuses on diseases that are exotic to Victoria but not to Australia and seeks to keep Victoria free of these diseases. For example, programs exist to prevent the spread of:

- fruit fly into Victoria from northern states and Western Australia through movement of fruit;
- annual ryegrass toxicity and branched broomrape from SA through trade in fodder and grain; and
- red imported fire ants from Queensland through horticultural and nursery produce.

Some Plant Standards Branch functions are performed in conjunction with industry or the Commonwealth or other State Governments. These include:

- Performing or contributing to risk assessments and the setting of national and interstate plant quarantine policies, standards and operational procedures, in close cooperation with Biosecurity Australia, the Australian Quarantine and Inspection Service (AQIS), interstate counterparts and industry organisations.
- Performing survey and eradication programs for exotic pests and diseases, in conjunction with the Office of the Chief Plant Protection Officer (DAFF). Recent examples include papaya fruit fly, fire blight and red imported fire ants. Plant Standards Branch also contributes to Victoria's emergency planning framework.
- In conjunction with other state and Commonwealth quarantine authorities, running publicity programs designed to make commercial traders, residents and the travelling public aware of the consequences of introducing pests such as fruit flies and phylloxera into Victoria, particularly to pest-free zones.
- Setting up and maintaining plant protection districts such as the TriState Fruit Fly Exclusion Zone, the Toolangi Plant Protection District and the North West and Henty Phylloxera Exclusion Zones.
- Following up reports of suspected plant diseases that are notified through the National Disease Reporting Service (free-call telephone service).

## 2.2 Legislation

Plant Standards Branch activities are underpinned by the Victorian Government's *Plant Health & Plant Products Act 1995*. The Act provides for:

- monitoring, controlling and eradication of plant pests and disease
- packaging, labelling and description of plants and plant products
- industry-funded schemes for pest and disease control measures and for compensating producers for the costs of controlling certain pests and diseases.

It also facilitates the movement of plants, plant products, used packages, used agricultural equipment and soil within and into and out of Victoria.

The Victorian Government's *Agricultural Industries Development Act 1990* may also be relevant for some plant health activities. The Act is designed to allow producers in a region or industry to raise funds for activities that will benefit all growers.

Other Acts which can be used in conjunction with the Victorian Government's *Plant Health and Plant Products Act 1995* are the *Catchment and Land Protection Act 1994*, the *Forests Act 1958* and the *Flora and Fauna Guarantee Act 1988*.

## 2.3 Other Relevant Organisations

The Branch has links to a range of industry associations, many of which are members of Plant Health Australia. These organisations are important in ensuring effective control of plant pests and diseases (see sections 4 & 5).

### 3. Types of Plant Pests and Diseases

Diseases are generally classified as exotic or endemic. Exotic means not present in a defined area. In plant health, classification of pests and diseases as exotic or endemic can depend on whether one is considering the state or national perspective.

Plant Health Australia (PHA) uses the more flexible terminology of 'emergency plant pest', which includes exotic pests, pests with potentially serious consequences and other pests that are under official control and absent from large areas. Most but not all of the emergency plant pests in the Emergency Plant Pest Response Deed (EPPRD) are exotic to Australia. For example, the list includes golden potato cyst nematode, which is under official control in Victoria and Western Australia but exotic to the other states. Fire blight is an emergency plant pest in both Australia and Victoria. Mediterranean fruit fly is exotic to Victoria but endemic to Western Australia.

From a national perspective, there are two broad classifications of plant pests and diseases:

- **exotic to Australia**
- **non-exotics.**

From a Victorian perspective, the non-exotics can be further split into three classes:

- exotic to Victoria, but endemic in other states
- endemic to Victoria but exotic to other states
- endemic to Victoria and other states.

While each category can be analysed as a separate problem, similar resources are required in all cases. Under the *Plant Health and Plant Products Act*, inspectors have general powers to deal with exotic and prescribed non-exotic pests and diseases. They have additional powers to deal with pests and diseases declared as exotic.

## **4. Management and Funding Arrangements for Plant Pests and Diseases Exotic to Australia**

### **4.1 Plant Health Australia**

Plant Health Australia (PHA) was formed in April 2000, after the Nairn Review of Quarantine (1996) recommended the development of a national coordinating body to identify and address national priority plant health issues. This recommendation followed the Review's observation that animal health issues in Australia were receiving greater emphasis compared to plants.

PHA's role in the plant industries is similar to the role Animal Health Australia (AHA) plays in the livestock industries. However, PHA is a newer organisation and its role is still developing. PHA is a not-for-profit public company and its activities are funded from annual subscriptions paid by members, including plant industry peak bodies and all government jurisdictions. DPI contributes to PHA on behalf of the Victorian Government.

PHA plays a coordinating role in developing and promoting the adoption of policies that improve Australia's ability to respond to and manage the risks of pests, diseases and weeds that affect commercial crops.

### **4.2 Current Funding Arrangements for National Exotic Incursions**

Eradication programs for emergency plant pest incursions are currently funded through a cost-sharing agreement between the Commonwealth and the states/territories. Under this agreement, the Commonwealth bears 50 per cent of eradication costs. The state and territory governments make up the remaining 50 per cent according to the relative GVP of susceptible crops in each jurisdiction. Until the EPPRD is ratified, industry does not make any compulsory contribution. The EPPRD mainly covers pests and diseases not found in Australia. It does not usually cover pests that spread from one area of Australia to another (e.g. Mediterranean fruit fly spreading from Western Australia to Victoria).

Decisions on eradication programs are made by the National Management Group (NMG), which is advised by a Consultative Committee on Exotic Plant Pests and Diseases (CCEPPD) established for each incursion. The CCEPPD comprises technical representatives from the Commonwealth and state governments and a PHA representative. It is chaired by the Chief Plant Protection Officer, who is based with the Department of Agriculture, Forestry and Fisheries (DAFF). Industry representatives may also be included on a CCEPPD, but currently only as observers.

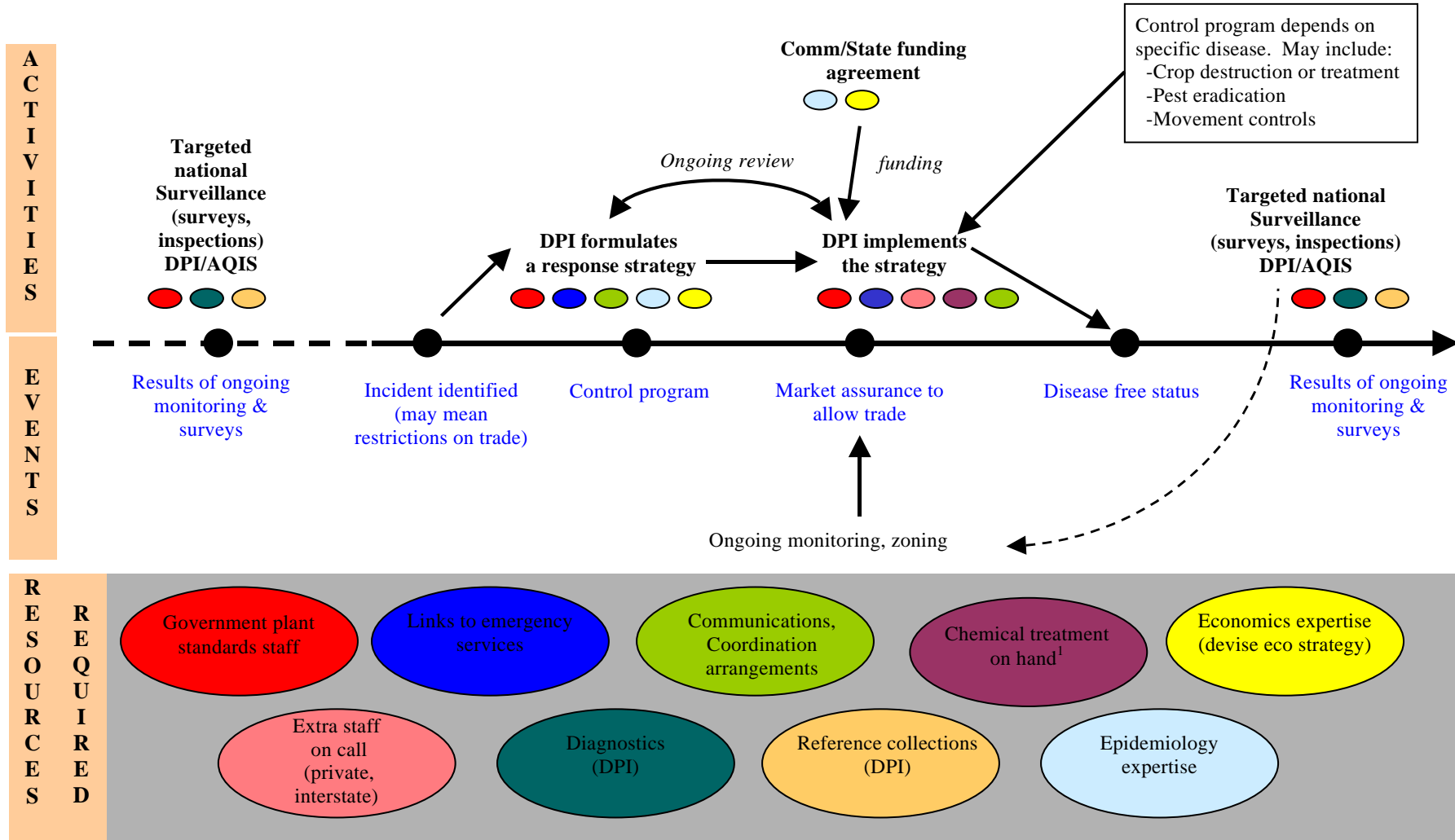
Before the NMG makes a decision to eradicate, the CCEPPD generally commissions a benefit-cost analysis to compare eradication and containment scenarios. Eradication will proceed if it is identified as a feasible and economic option. The CCEPPD develops a budget that will be endorsed by NMG if eradication is approved. Funding is reviewed annually for multi-year projects and must be approved by Primary Industries Standing Committee (PISC) and endorsed by Primary Industries Ministerial Council (PIMC).

At the state level, there are some inconsistencies in legislation regarding compensation for exotic plant pests and diseases. In NSW and Victoria, the legislation is silent on compensation. In Queensland, compensation is paid when healthy crops are destroyed to prevent disease infestation, but not when diseased crops are destroyed. Western Australia provides compensation only for skeleton weed. PHA has advised all jurisdictions that they will need to change legislation to enable grower reimbursement. There are instances of compensation being paid by governments, generally as *ex gratia* payments, or through voluntary industry contributions. In some cases, governments have acted on the basis that a voluntary industry fund for compensation would be established (eg. asparagus rust in Queensland).

### **4.3 Characteristics of Emergency Pest Management**

Minimising the impact of an emergency plant disease incursion depends on rapid detection and response. This requires a bank of specialist skills and resources to be maintained so that it can be called upon at short notice. Figure 1 provides an overview of the types of resources and processes required to effectively respond to an exotic incursion.

**FIGURE 1: PROCESS MAP - EMERGENCY PLANT PEST & DISEASE**



<sup>1</sup> and to fast tracking approval of non-registered chemicals.

Key observations on exotic incursion management are:

- An emergency plant pest incursion can have a large potential impact but the risk of it occurring is uncertain. For example, the cost of red imported fire ant becoming established in Australia is estimated at \$2.2 billion in present value terms. As with animals, an exotic incursion can halt access to export markets (worth over \$1.8 billion in total to Victoria in 2001/02), causing sudden economic shocks to affected industries. The introduction of new diseases can also limit the future growth of export markets for plant industries, including markets that have displayed significant growth over the last decade.<sup>1</sup> With animals, there is a risk that domestic demand will fall due to the existence (or perception of the existence) of a zoonotic disease. Although this is not as important for plants, domestic supply and demand can be adversely affected in the short- to medium-term by interstate restrictions or consumer concerns about produce quality or chemical residues.
- The detection of an exotic pest will have increasingly negative impacts on market access unless new disinfestation technologies can be found to replace some chemical and other methods that are currently being phased out.
- Exotic plant diseases can also affect other sectors of the economy, as well as the environment and human health (e.g. red imported fire ants).
- There are many more plant pests and diseases than animal diseases. This means a larger number of more moderate risks, compared to animals.
- A rapid and effective response is vital. Success in containing and then eradicating an exotic plant incursion is heavily dependent on early detection and rapid response. It is important for detection and response functions to be well-resourced, given the high returns on this investment.
- Strategy development is important. Epidemiological and economic skills are needed to develop and assess potential strategies. In plant health, the choice is generally between eradication and containment. Cost-benefit analyses are useful for making this selection.

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<sup>1</sup> Worth \$487 million in 2000/01, Victorian horticulture exports have increased by 5.1 per cent a year since 1993/94. Victorian grains exports were worth \$1369 million in 2001/02, and have increased by 8.3 per cent a year since 1993/94.

## 4.4 Analysis of Funding Arrangements for Emergency Plant Pests

*Because industry and the community benefit from many plant health actions, cost-sharing and cost recovery feature in any discussion of funding arrangements. These issues are more complex than animal health cost-sharing arrangements for a number of reasons, including:*

- the large number of plant crops and plant industries
- the large number of plant pests and diseases
- the fact that many plant pests and diseases affect many crops, often to different extents
- more complex marketing arrangements.

Since the establishment of PHA, several groups have analysed Australia's plant health funding arrangements, particularly the Centre for International Economics as a consultant to PHA. PHA has acknowledged that current arrangements can be improved and the Emergency Plant Pest Response Deed includes formulas for industry contributions depending on the relative benefit that industry sectors gain from the eradication.

### 4.4.1 Use of benefit-cost analysis

The national arrangements embrace the use of benefit-cost analysis as a prerequisite for preparing a response plan. While it should not be allowed to unnecessarily delay response efforts, benefit-cost analysis is vital to good decision-making and can help avoid wasting resources. Australia and New Zealand routinely use benefit-cost analysis for assessing eradication programs, but many other countries do not. A review of the UK Ministry of Agriculture, Food and Fibre's plant health program noted that 'with the notable exception of Australia and New Zealand, very little work has been done to evaluate the costs and benefits of reducing the risk of plant pests or invasive species, and of various control options' (ADAS Consulting and Imperial College, 2001).

### 4.4.2 No compensation

Growers whose crops are destroyed or who are otherwise affected by an eradication program do not currently receive compensation although the Emergency Plant Pest Response Deed will soon overcome this deficiency. The current situation is of concern for two reasons.

**Incentives for reporting exotic disease**—Lack of compensation creates a disincentive to report suspected cases of exotic disease. While a grower will generally wish to do the right thing for the industry and notify authorities of suspected exotic incursions, he/she may be reluctant to do so if the consequences would be a large financial loss, or even bankruptcy. Compared to the animal

industries, this creates a further barrier to rapid detection. This is in addition to the stigma of being labelled a 'diseased or infested property'.

**Equity**—The current situation places the cost of managing an emergency plant pest incursion inequitably on those growers who have the disease. The benefits of eradicating a plant disease or pest flow to the whole industry or even to more than one industry, and the costs should be met by the industry or industries rather than affected growers.

However, developing a compensation program for plant health has been more difficult than for animal health. Under the Emergency Animal Disease Response Agreement (EADRA) animal owners are compensated for the market value of livestock destroyed as part of eradication efforts or that died from the disease. Paying the market value of crops destroyed would be feasible for annual crops, but compensation becomes more complex when perennial crops are involved. In such cases, the loss of the future income from the affected plantings would need to be considered as well as the value of alternative uses of the land. For animals, compensation for the destruction of domestic animals and domestic property is provided under the EADRA.

A recent PHA discussion paper (PHA, 2001) argued that growers should be compensated for the impact of eradication efforts, but not the impact of the disease itself. This stance differs from the EADRA, which does not distinguish between losses from the disease and losses from eradication efforts (and does not provide for consequential loss of income, loss of future income or indirect losses). PHA argued that the impact of disease is a risk that growers should be prepared for as part of their normal risk management. This approach is understood to be common in the US. However, not being compensated for the impact of a disease may further reduce incentives for growers to report a suspected emergency plant pest.

Industry and government jurisdictions have agreed in principle to grower reimbursement. This is a critical part of the Emergency Plant Pest Response Deed that will be signed by all parties.

#### **4.4.3 Lack of industry funding**

The current national agreement between the states/territories and Commonwealth does not call for industry funding contributions. However, industry will contribute to funding of the Emergency Plant Pest Response Deed. This is important for the following reasons:

**Matching funding with beneficiaries**—Public funds should be used to develop core infrastructure to detect, prepare for and respond to emergency plant pests. In terms of funding for response efforts, the highest priority for public funds is pests and diseases that impose external costs on the environment or human health or have cross-sectoral impacts. Industry funds should be used for programs that improve industry profitability and productivity. Many diseases affect both industry and the broader public, and should therefore receive a mix of industry

and public funds. Implementing this approach for plant industries presents significant challenges because of the number of industries, the large number of pests and diseases, and the fact that a single pest or disease can affect many crops. Furthermore, multiple-crop specific diseases usually affect different crops to different degrees, making cost-sharing even harder to define. These issues are clearly defined in the Emergency Plant Pest Response Deed, which will bring industry funding more in line with industry benefits from plant pest and disease activities.

**Involvement of industry in decision-making**—Because the plant industries do not currently fund any eradication and control work, the industries have no incentive to question the efficiency of this work. If industry was engaged in decision-making, but did not provide funds, there would still be little incentive for industry to scrutinise the effectiveness of public spending and encourage cost-effective programs. Only when industry both funds the work and has a role in the decision-making will the incentives be in place for more efficient resource allocation in this area.

#### **4.4.4 Lack of pre-agreed funding shares**

The Emergency Plant Pest Response Deed will enable plant pests and diseases to be categorised for national cost-sharing purposes—in advance of any outbreak. This will eliminate the problem of trying to resolve funding at the time of an outbreak.

However, the Deed does not generally consider how to deal with pests exotic to Victoria but endemic to other parts of Australia. Plant Health Australia could play an important role in the future in resolving issues of localised eradication in specific regions, following the precedent set in the localised eradication of banana black sigatoka in Tully in 2000.

#### **4.4.5 Eradication versus control costs**

Under the current national cost-sharing agreement, the Commonwealth will fund eradication work but not control work. This is because the states are responsible for containing diseases within their jurisdictions. In principle, however, this arrangement will tend to bias State decisions towards eradication (over the containment option) and Commonwealth decisions towards containment (over eradication). When national cost-sharing arrangements are terminated because an exotic pest is judged to be no longer eradicable, local containment or control programs are often hampered by lack of funding from the relevant state governments and industry. This issue needs to be addressed as part of new funding arrangements.

#### **4.4.6 Further development of response plans may be required**

PLANTPLAN is the plant industry's equivalent to the livestock industry's AUSVETPLAN. Plant Health Australia, in conjunction with major plant industries, has begun developing industry-specific biosecurity plans and prioritising pest

risks. One issue to be considered here is the extent to which specific pre-prepared plans should be developed as an alternative to a broader consideration of plant and disease risks combined with tailored response plans that are developed when an incursion occurs. Not having specific pre-prepared plans may delay the response, and hence result in a greater cost to industry and the community.

## **4.5 Analysis of Resource Requirements for Emergency Plant Pests**

Given the ongoing growth in international and domestic passenger traffic and trade in goods and services, emergency plant pests are becoming an increasing risk to the plant industries. Furthermore, the WTO Sanitary and Phytosanitary Agreement requires Victoria (and Australia) to use active surveys to **prove** freedom from a particular disease before certification can be granted.

Investment in infrastructure to enable a faster response to exotic pest and disease incursions can be expected to produce a good return.

### **4.5.1 Property identification**

Regardless of whether it involves product movement controls, an eradication strategy requires accurate identification of infected and contact premises. To help improve response rates, Plant Standards Branch has proposed the development of a registration system for growers in the plant industries. Such a database would enable rapid identification of 'at-risk' properties within a quarantine or restricted area to assist in containment and eradication efforts. It would also improve Victoria's ability to trace produce identified as containing disease and/or chemical residues (e.g. at the Melbourne Market) back to farm of origin. The database could also have a non-emergency role of monitoring endemic pests and diseases.

### **4.5.2 Diagnostics**

Diagnostic services are vital for the early detection of emergency plant pests. Unlike the animal health program, plant diagnostic services are directly provided by DPI. While private providers (e.g. chemical companies) may diagnose common pests and diseases, expertise for diagnosis of emergency plant pests resides in government, university or overseas laboratories. One reason for this difference is that veterinary pathology requires similar technology and infrastructure as human pathology, which is a well-developed market due to the volume of demand.

Moran and Muirhead (2002) completed a survey of the status of human resources involved in diagnostics for plant pests and pathogens. Sixty-one survey responses were received: 42 from government laboratories, 10 from universities, two from

private laboratories and seven from DAFF. These groups represent all major diagnostic providers in Australia. The survey produced the following observations:

- Laboratories have imposed or are introducing fees for services, but there are significant differences between the level of cost recovery by private and government sources in different states and territories.
- Commercially-oriented government diagnostic services compete within and between states for business.
- Funding was an issue for all survey respondents.
- There is little quality control to ensure the delivery of standardised techniques and methods such as those used in veterinary laboratories in Australia. (This issue has been discussed at Plant Health Committee, which together with Plant Health Australia will decide what protocols and accreditation are required.)
- Documented procedures for identifying exotic pests and diseases are generally not available, and many laboratories have limited capabilities for identifying exotic plant pests and plant pathogens.
- Resources in some plant diagnostic disciplines appear to have declined in recent years, potentially compromising national capability in these areas.
- There is little evidence of a structured approach to succession planning to address the issue of replacing ageing diagnostic scientists.

Diagnostic services have a crucial role in ensuring early detection of disease, and early detection can have huge payoffs. The above observations raise a concern that has also been noted for animals: that raising fees for diagnostics can act as a disincentive for industry members seeking to have suspected disease incidents tested. The benefits of discovering an exotic incursion will usually flow to a number of plant industries and the community. Thus it could be argued that the availability of diagnostic services should not depend on what individuals are prepared to pay for a diagnostic test. Some level of industry and public funding is justified by the benefits to these two groups from early detection of disease.

Table 4 shows the current status of funding and cost-recovery by diagnostic services around the nation. There are major differences between jurisdictions.

**Table 4: Revenue and specimen sources by state**

| Source of revenue         | VIC           | NSW           | SA            | QLD*          | WA            | TAS           | NT            |
|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Contract services         | 16.5%         | 5.3%          | 32.8%         | 6.5%          | 0.3%          | 29.4%         | 0%            |
| Diagnostic fees           | 40.1%         | 6.3%          | 52%           | 3.5%          | 16.1%         | 41.1%         | 0%            |
| Other funding             | 0.1%          | 0%            | 0.2%          | 0.1%          | 0%            | 2.0%          | 0%            |
| Government funding        | 43.3%         | 88.4%         | 15%           | 90%           | 83.6%         | 27.6%         | 100%          |
| <b>Total funding</b>      | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b> |
| Specimens from government | 17.3%         | 61.1%         | 4.5%          | 82%           | 73.1%         | 34.1%         | 43.1%         |

Source: Moran & Muirhead (2002), Tables 6 & 7, page 14.

\* Queensland processes a significant number of samples for overseas countries.

Total funding may not sum to 100% due to rounding.

A database on emergency plant pests is available on the PHA website ([www.planthealthaustralia.com.au](http://www.planthealthaustralia.com.au)). The database is maintained and updated with PHA, state and Commonwealth funding.

#### 4.5.3 Decision support

Improving the likelihood of making the correct decision about responding to an exotic incursion is another area that can have huge payoffs. This requires having good information about the problem (e.g. grower registration) and the right combination of skills to interpret this information and effect an appropriate response. As well as scientific and technical skills, epidemiology and economics expertise are key requirements. It is vital that Victoria has adequate access to these skills.

#### 4.5.4 Monitoring (surveys)

Monitoring is vital for discovering the presence of pests and pathogens, and defining the extent of outbreaks when responding to incursions and proving pest and disease freedom following an eradication program or for trade purposes. As noted in Section 4.5, disease freedom must now be based on active survey rather than on reports that disease has not been detected previously in the area. As a result, future demands for monitoring resources are likely to increase.

Some states run annual surveys for targeted pests while others survey particular commodities for exotics in general. Victoria undertakes limited port surveillance for exotic fruit fly and Asian gypsy moth, with Commonwealth funding. To maintain area freedom status, Victoria also conducts surveys for Queensland and Mediterranean fruit flies, lupin anthracnose, fire ants, asparagus stem diseases, phylloxera and potato cyst nematode. The beneficiaries of surveillance activities vary with the nature of the disease and the purpose of the survey.

The cost of surveillance following an exotic incursion would be covered under future PHA cost-sharing arrangements. Industry contributes to the cost of surveys to prove disease freedom, particularly for trade certification purposes (e.g. fruit flies), but this is generally on an ad hoc basis.

Interstate experience in managing papaya and fire ant incursions has shown that a good pest management system is essential for effective emergency response.

#### **4.5.5 Research and development**

To fulfil its role, Plant Standards Branch needs to be fully informed about the impact of different pests and diseases. Instances can arise where there is not enough information available for effective decision-making on eradication or containment strategies, and further research is required. For example, more knowledge may be required to enable the identification of exotic pests and pathogens, or to develop disinfestation and other treatments to enable product movement certification, or to conduct pest risk analyses for plants and produce.

### **4.6 Linking Commonwealth and State Responsibilities**

At an operational level, good co-operation with AQIS is required to ensure an effective quarantine barrier continuum. There is scope for further cooperation between Plant Standards Branch and AQIS on domestic quarantine issues such as surveillance for exotics at first ports of call, area and property certification for trade purposes, quarantine publicity about exotic organisms and trace-back systems for imported products within Australia.

## 5. Management and Funding Arrangements for Pests and Diseases not Exotic to Australia

The current national funding agreement only covers the eradication of truly national exotic incursions. This reflects Commonwealth responsibilities for barrier control and surveillance and state responsibilities for post-barrier pest and disease surveillance and control. As a result, all eradication or control programs for pests and diseases that are not truly national exotics are developed on a case-by-case basis. This is usually done by each state acting alone, but when there are cross-border issues, such as fruit fly, agreements between state governments can be established.

Pests and diseases in this category mainly affect the productivity of plant industries. Some also affect market access, e.g. Queensland fruit fly and branched broomrape, while others have environmental impacts. Efforts to respond to non-emergency plant pests should focus on controlling spread, with eradication only attempted where this is likely to be feasible and economically viable. The Emergency Plant Pest Response Deed provides some flexibility in this respect. As with animal diseases, the term 'emergency' is used so that response action is not restricted to exotic diseases only. Local eradication attempts may be made on locally endemic pests and diseases on a case-by-case basis. However, as with the current situation for animal health, there is a danger that a case-by-case process for developing projects will lead to future inconsistencies between issues and between industries. A consistent framework that states the key principles and steps required in developing programs for non-national-exotic pests and diseases should address the following points:

*Select an effective strategy*— Efforts must be made at the outset to assess the options and determine the best possible strategy to address the pest or disease. Consideration should be given to an appropriate legislative framework, benefit-cost analysis and a process to determine endemic pest status.

*Adopt a 'beneficiary pays' approach*— The level of industry funding will depend on the beneficiary model developed in the Emergency Plant Pest Response Deed. For pests and diseases that primarily affect industry productivity, it should be industry that decides what action is to be taken. Industry groups may not always be fully aware of the issues, so Plant Standards Branch has a key leadership, educational and advisory role.

*Ensure adequate industry scrutiny of government programs*— The incentive to scrutinise will be greater when industry is contributing.

*Encourage information sharing*— Incentives and other mechanisms may be required to ensure that industry participants reveal information about pests and diseases.

## 5.1 Pests and Diseases Exotic to Victoria but Endemic in Other States

While quarantine at a national level is vital to minimise the incidence of exotic incursions, quarantine within specific regions is important to prevent pests and diseases spreading between jurisdictions. The states are responsible for controlling pests and diseases under the Constitution, which creates incentives for quarantine to exist at state borders.

However, because pests and diseases do not respect state borders, pests such as Queensland fruit fly require a multi-state approach to establish and maintain a pest-free area. This has worked reasonably well with the Tri-state Fruit Fly Program.

Controlling the spread of pests and diseases that require a multi-state approach depends on interstate imports being subjected to movement controls and disease/pest certification. It also depends on interstate industries and governments taking action to control the spread of the pest or disease across the Victorian border. Major pests and diseases that fall under this category include Queensland fruit fly, Mediterranean fruit fly and branched broomrape.

## 5.2 Pests and Diseases Endemic to Victoria but Exotic to Other States

Some pests and diseases that are endemic to Victoria but not present in other States have significant negative attributes and can therefore affect interstate and international market access for Victorian produce. Examples include phylloxera (although this is also present in one area of NSW) and potato cyst nematode.

Efforts to combat pests and diseases in this category can include:

- certifying local produce as being disease-free to enable its export interstate or overseas
- controlling the spread of the pest or disease.

Eradication is not usually an option for endemics, but treatments such as fumigation or the use of rotations or resistant varieties in combination with quarantine measures can be used to reduce spread or achieve market access.

## 5.3 Pests and Diseases Endemic to Victoria and Australia

For diseases in this category, the focus is usually on controlling their spread—or doing nothing if the impacts are not sufficient to warrant any action. Eradication is very rarely an option.

### **Western flower thrip**

Western flower thrip (WFT) is endemic to all mainland States but under official control in Tasmania. Victoria maintains controls on WFT to prevent the pest spreading to the Toolangi Plant Protection District. Plant Standards Branch

operates an extensive WFT surveillance program at some 300 accredited nurseries and other properties throughout the state to certify that material moving to Toolangi or to Tasmania is free of the pest. Nurseries pay for surveillance conducted by third-party providers. Plant Standards Branch certifies the nurseries under an accreditation and auditing system.

### **Other prescribed pests**

Victorian plant health legislation identifies well over 200 prescribed plant pests and diseases that are endemic to Australia but harmful to agriculture and the environment. Most of these must be managed in a regional context rather than on a property-by-property basis.

Plant Standards Branch has responsibility under this legislation to investigate complaints about lack of control of such pests and diseases in neglected properties and to ensure owners manage them effectively to prevent their spread. Complaints about neglected land are increasing as traditional farming land is subdivided for housing, or where growers abandon traditional crops and move to others. Plant Standards Branch envisages increased activity in this area.

## **5.4 Other Issues - Environment**

There are few formal arrangements to monitor pests with environmental implications but little or no economic impact otherwise. One exception is Asian gipsy moth, which the University of Melbourne monitors at ports of entry under contract from the Department of Agriculture, Forestry and Fisheries (DAFF). This program is similar to the exotic fruit fly monitoring program undertaken at ports by Plant Standards Branch for DAFF.

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