

Biosecurity for Australia requires collective action from all stakeholders Who should care about weeds and other pest incursions?

Rob Delane¹ and Sandra G. (Sandy) Lloyd²

¹Department of Agriculture, Locked Bag 4, Bentley Delivery Centre, Western Australia 6983, Australia

²Cooperative Research Centre for Australian Weed Management

Summary Western Australians are probably among the most quarantine-aware people in the world; however, the current attention to quarantine was not always the case. From the early days of settlement until relatively recent times, many inappropriate plants and animals were introduced into an environment largely free of predators and pests. A significant number of these introductions have become serious agricultural and/or environmental pests. This is particularly obvious for weeds, which impose high cost on agriculture, threaten ecosystems and endangered species, and are inexorably changing the unique and fragile floral landscape of WA. While there have been dramatic improvements in national and international quarantine measures, attempts to introduce invasive species continue. A move towards a more holistic biosecurity approach, heightened public awareness and focus on complementary roles and responsibilities is vital for both current and future generations.

Keywords Biosecurity, quarantine, incursions, public awareness, policy.

INTRODUCTION

Western Australia has one of the most pest and disease free environments in what is probably the 'cleanest' developed country in the world. This is due to a combination of factors including our relatively recent development, our geographical isolation, and relatively good quarantine practices for much of the last century.

Some 1194 exotic plants have naturalised in WA since European settlement (Western Australian Herbarium 1998). Our diverse and fragile ecosystems are not adapted to cope with weed invasion, especially grass weeds. In 'the Wildflower State' it is unfortunate that many of the colourful spring 'wildflowers' seen on roadsides and in bushland, especially around Perth, are actually exotics from South Africa and the Mediterranean. Recent analyses have shown that weeds have an even greater national cost to agriculture and the environment than does salinity, (Australian Bureau of Statistics 2001, PMSEIC 2002)

The authors discuss how an appropriate level of biosecurity can be achieved for the State's agriculture, environment and community, without continuing reliance on the paternalistic approaches of the past. It is argued that the principles of biosecurity are quite

simple – based on the example that 'safe sex is simply good personal biosecurity'; and that there is no excuse for not understanding what is meant by biosecurity, or what needs to be done to achieve broader participation in biosecurity solutions.

DISCUSSION

The recent outbreak of foot and mouth disease (FMD) in the United Kingdom has dramatically raised the awareness of the international community to the impact of outbreaks of such serious animal diseases. The UK experience has demonstrated to all community members that such problems are not just farming issues, but can affect almost every aspect of community life in affected areas. Every visitor to Australia is now reminded of the implications of such a disease outbreak by the dramatic increase in quarantine measures implemented by the Australian Quarantine Inspection Service (AQIS), which are funded from increased taxes on travellers. Strengthened measures have also been implemented for cargo imports and international mail. Unfortunately, the general public still remains largely ignorant of the impact of many weedy plants and plant pests, and of practical steps they can take to minimise the risk of being carriers for such weeds and pests.

No potential pathway of disease, pest or weed incursion can be ignored in ensuring that the biological risks to Australia's agriculture, environment and community are adequately addressed – without imposing inappropriate imposts on trade, travel and communication. Interstate and intrastate measures have also been implemented; and it's not just animal diseases such as FMD that are targeted.

Each year in WA, over 100,000 vehicles are stopped at road checkpoints resulting in nearly 50,000 seizures involving 22,000 kilograms of quarantine risk material. 12,000 domestic flights carrying more than 1 million passengers are checked annually by domestic quarantine officers. Last year, 3,200 kilograms of quarantine risk material was seized. X-ray and detector dog screening of mail and parcel freight also identified large numbers of items containing prohibited seed and plant material.

All of this activity, plus the 1996 Nairn Review of Australian Quarantine, should have established quarantine and the security of Australia's biological resources as high profile issues in the consciousness of Australians.

But are all these measures sufficient? Are they correctly targeted? Does the solution require greater action and innovation by government, industry and community sectors? Or is an entirely new paradigm of thinking and action needed?

The biosecurity challenge So what is biosecurity? New Zealanders are among the globe's leading thinkers on biosecurity, and the NZ Biosecurity Council (2001) has defined biosecurity as: '*Protection from risks posed by organisms to the economy, environment and people's health through exclusion, eradication and control*'. In the animal industries, biosecurity (biological risk management) is broadly defined as a set of measures designed to protect a population from transmissible infectious agents at a national, regional and individual farm level. At the farm level it involves the systematic approach of livestock owners on an industry-wide basis in providing protection to their flocks and herds against the entry and spread of diseases.

Sometimes, to aid comprehension, it is helpful to bring the subject matter very close to home. We would surely have no major difficulty coming to grips with the principles of personal biosecurity – after all, that is what the safe sex message is all about isn't it? Yet in Australia, it took a major national media campaign, persistent education programs targeted at all beneficiaries and advertising in almost every public toilet to achieve what most would regard as a marginal level of compliance with adequate biosecurity practices.

Biosecurity within international travel and trade is just like safe sex – achieving good risk management, without impeding trade, with good co-regulation from both risk creators (and beneficiaries), at low cost, while obviating the need for inspection, accreditation or other intrusive regulation.

If it were then so clear, and if we all understand what biosecurity means, then it should not be difficult to achieve an appropriate level of biosecurity for Australia's increasingly diverse agriculture, diverse and fragile native ecosystems and public amenities. However, our nation is spread over a land mass greater than Europe with an ocean border of many thousands of kilometres and dozens of airports and seaports capable of receiving international flights, ships or yachts, discharging thousands of items of cargo and millions of passengers each year. Obviously, it is an enormous challenge that quarantine inspectors and detector dogs will not achieve on their own.

A NZ review of biosecurity issues had concluded that biosecurity should be taken as seriously as national security. The NZ Minister for Biosecurity, the Hon. Jim Sutton, has asked the Biosecurity Council to coordinate the development of a Biosecurity Strategy

for NZ by December 2002. The opening sentence of the Issues Paper states: 'All New Zealanders have a part to play in maintaining New Zealand's biosecurity' (Biosecurity Council 2001).

So is the situation different in Australia? Surely the Australian case is more complex, and demands even stronger leadership from governments and greater participation from all stakeholders? Yet there seems to be a general view in this country that biosecurity is someone else's problem, that 'the government' should solve it (but which government?), or that like any other downside of globalisation, it should just go away because we don't like it.

WEED MANAGEMENT

Examples of community roles While public awareness is high, as shown by the number of reports received by the Department of Agriculture regarding incursions of pests such as starlings and European wasps, and of infestations of declared (regulated) plants or suspect 'new' weeds, weed awareness is not nearly high enough. A particular gap is knowledge of what can and should be done about weeds.

While it is easy to appreciate the potential problems of animal diseases, insect pests, plant pathogens and vertebrate pests or 'vermin', weed impacts are not always easy to define or acknowledge. Many of our most serious weeds were introduced as garden plants, and have attractive flowers that belie their true nature.

The insidious nature of many weed problems combined with relatively widespread ignorance of the specific impacts of weeds, and indeed what plants are weeds, means that such problems are deserving of special attention if appropriate action is to occur.

Declared aquatic plants, for example, have been subject to a strong awareness campaign in WA since early 1998 when there were several finds of species including salvinia (*Salvinia molesta* D.S.Mitch.) and water hyacinth (*Eichhornia crassipes* (Mart.) Solms). Confirmed reports of declared aquatic plants from members of the public have increased from about six a year to three per month. However, this is only 'the tip of the iceberg' where weeds are concerned – other weed infestations have been established for many years before they are identified.

Since 1997, National Weedbuster Week has played an important role in raising public awareness about weeds. The national Cooperative Research Centre for Weed Management Systems (now CRC for Australian Weed Management) has also played a major role in raising public awareness about weeds, particularly through the work of the Environmental Weed Education Officer. When we see articles in gardening magazines with titles such as *How to annihilate garden*

thugs, we know the message is getting through!

Community groups such as the Environmental Weeds Action Network (EWAN), Weed Action Groups and regional herbaria are all playing valuable roles. What must be appreciated by all stakeholders is that minimisation of the impact of weeds will only happen through the complementary actions of individuals, community and industry groups and government at all levels – it will not happen by itself – and in almost all cases, a high level of local community and individual commitment will be essential.

The State Weed Plan for Western Australia (Anon. 2001) articulates how action against weeds must begin at the patch/property level – where an individual, or small group of people, must take responsibility. Assistance in a range of ways must be provided by governments; however, it is perhaps the action (or inaction) of each landholder that will make a difference.

Examples of Government roles The move to a Permitted list system for the introduction of new plants was an historic one – there is no better way as it is almost impossible to prohibit all the high risk plants by using a ‘prohibited list’ approach.

The introduction of plant screening and the associated permitted list approach was initiated in WA in late 1996 – a world first – followed nationally by AQIS and shortly thereafter by NZ. While there have been some teething problems, because of strong industry support this system has succeeded. Other countries with strong ‘free trade’ aligned lobby groups have resisted the introduction of such a successful system, despite its benefits to these same groups.

Mail order catalogues have been a common way of ordering the seeds and bulbs of garden plants and vegetables since the early days of the postal system. Paterson’s curse (*Echium plantagineum* L.), for example, was available in Australian garden mail order catalogues in the 1840s (Lloyd 2000a,b).

With the advent of internet catalogues, mail order plants are now even easier to obtain, and thousands of species are available from around the world (Lloyd 2000c). X-ray and detector dog screening of international mail has been increased dramatically in recent times to deal with the obvious high threat of quarantine risk material entering Australia.

During a six month period in 2001, 1.3 million postal items were screened for commodities of quarantine concern at the Perth International Parcel Centre. Of these, 11,300 postal items were found to contain materials of concern, including meat, dairy and egg products and animal equipment; as well as seeds, bulbs and other plant material. In all, 1700 postal items had commodities that were removed and seized

for destruction or re-export. Of these 1700 items, 138 contained seed, 20 contained bulbs and 11 contained plant cuttings.

In addition, samples or ‘gifts’ of prohibited seeds and bulbs have been detected in overseas-published gardening magazines posted to Australian subscribers. Undeclared or mis-declared prohibited plant cuttings have been detected in rolled up damp paper inside cardboard cylinders. Prohibited plants and bulbs have been detected wrapped in clothing in parcels declared as ‘clothing only’.

Internet ordering of plants and other quarantine risk material is also of great concern in the USA, so much so the US Department of Agriculture (USDA) is working with researchers from the North Carolina State University to develop a webcrawler to identify internet sites supplying species of concern (Rotstein *et al.* 2002) (the WA Department of Agriculture is also a collaborator on this project). The Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW) also identifies e-commerce in invasive plants as an important mode of spread (FICMNEW 2001).

FICMNEW discussed the need for international cooperation and the development of a global early warning system in their *National Early Warning and Rapid Response System For Invasive Plants in the United States* (FICMNEW 2001). One objective of this system is to develop protocols for information sharing on new and emerging invasive plants, including e-commerce in species of concern, with agencies in designated partner nations.

The Australian Weeds Committee (AWC) also endorses the need for international cooperation and dissemination of information. There are protocols in place for this to occur at a high level, however information must be disseminated more effectively. That is, relevant information is needed not just by bureaucrats, but at the ‘coalface’ – the ports, airports, mail centres etc. – where new plant incursions could occur. AWC is currently examining how to expand existing communication systems, including: collaborating on the internet surveillance project, and increasing communication with FICMNEW and the US Animal and Plant Health Inspection Service (APHIS) Weed Team.

Examples of industry role In 1996, two major incidents impacted on the WA grains industry: the incursion of lupin anthracnose (*Colletotrichum gloeosporioides* (Penz.) Penz. & Sacc.), and the importation of canola seed contaminated with weed seeds including cleavers (*Galium aparine* L.). It was clear that a more pro-active approach was required to the prevention of and response to pest and disease incursions.

With a wide range of exotic weed, pest and disease threats to individual grain industries, plus potentially serious impacts on overall production systems from the most serious threats, it was imperative that any investment in preventative and responsive strategies should be targeted to the most cost-effective options. It had also become clear that there were significant gaps in both the prevention strategies and the methods used for dealing with such incursions, while in other areas there was wasteful duplication resulting from government and industry working in isolation of each other.

An inclusive approach to biological risk management has been developed and implemented in WA under the GrainGuard™ and other Guard initiatives. This approach is recommended as a basis for improved biological risk management (biosecurity) for Australia's agricultural industries, and may have application internationally. It is argued that such modern business risk management processes must be applied to agriculture generally, and biosecurity of agriculture in particular.

Both technical experts and industry members need to work logically through the risk management process, beginning with threat identification and risk assessment, and followed by determination of the most appropriate risk management strategies, and good information flow between all major stakeholders.

It is accepted internationally that all new weed incursions can only be eradicated if located early and targeted before the infestation spreads, and often before it exceeds one hectare. The one exception to this was the eradication of kochia (*Bassia scoparia* (L.) A.J.Scott) from WA (Dodd and Randall 2002).

Unfortunately, the Australian experience with such serious weeds as branched broomrape (*Orobanche ramosa* L.), skeleton weed (*Chondrilla juncea* L.) and herbicide resistant weeds, is that action began far too late to enable eradication to be cost-effectively achieved.

Biosecurity is everyone's responsibility Everyone can have a positive or negative impact on the biosecurity of the agriculture, environment and community facilities of a region, State or country. The slogan adopted by the Department of Agriculture 'protecting agriculture is everyone's business' has aimed to highlight to all stakeholders the critical role they all play. The slogan 'biosecurity is everyone's responsibility' is also now used.

Just as charity begins at home, biosecurity begins on your home patch. Every individual and business can put in place simple steps to ensure that their activities do not compromise the biosecurity of their own business, or that of someone else, or of public property such as our national parks.

Every weed expert and extension officer can

also make a valuable contribution to mitigating weed risk, but only if we all work to ensure that our roles are complementary. The roles of all must be built on acceptance by each landholder of their responsibility for managing weed risk to their small or large part of Australia – and the world.

REFERENCES

- Anon. (2001). Western Australia's State Weed Plan – a new strategy in the war on weeds. Bulletin 4490 Department of Agriculture, Western Australia (also URL: www.agric.wa.gov.au/swp).
- Australian Bureau of Statistics (2001). 4613.0 Australia's Environment: Issues and Trends URL: <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/NT0001B20A>.
- Biosecurity Council (2001). Biosecurity strategy for New Zealand – issues paper. *New Zealand Biosecurity Council*.
- Dodd, J. and Randall, R.P. (2002). Eradication of Kochia (*Bassia scoparia* (L.) A.J.Scott) in Western Australia. Proceedings of the 13th Australian Weeds Conference, Perth.
- FICMNEW (2001). National early warning and rapid response system for invasive plants in the United States. Unpublished report.
- Lloyd, S.G. (2000a). You've got mail – the postal system as a vector for weeds. Proceedings of the 40th Weed Science Society of America Meeting, Toronto, Canada, p. 127.
- Lloyd, S.G. (2000b). The postal system as a vector for weeds. Proceedings of the III International Weed Science Congress, Foz do Iguassu, Brazil.
- Lloyd, S.G. (2000c). Alien invasive species for sale on the internet *Aliens No. 10 1999/2000*, Invasive Species Specialist Group of the IUCN Species Survival Commission, p. 11.
- PMSEIC (2002). Sustaining our natural systems and biodiversity. Report prepared for the 8th meeting of the Prime Minister's Science, Engineering and Innovation Council URL: www.dest.gov.au/science/pmseic/meetings/8thmeeting.htm.
- Rotstein, M.J., Lloyd, S.G., Fowler, A.L. and Stinner, R.E. (2002). Internet surveillance – new web search and response application is a valuable biosecurity tool. Proceedings of the 13th Australian Weeds Conference, Perth.
- SA/SNZ (1999). Risk Management AS/NZS 4360: 1999 Standards Australia/Standards New Zealand, Strathfield and Wellington.
- Western Australian Herbarium (1998). FloraBase – Information on the Western Australian flora. Dept. of Conservation and Land Management. URL: www.calm.wa.gov.au/science/florabase.html.