Abstract The Australian Quarantine and Inspection Service (AQIS) regulates the importation of plants into Australia to minimise the risk of introducing exotic weeds. AQIS operates on the principle of managed risk, utilising decision making processes consistent with relevant international trade agreements and standards to identify risks and management options. The objective is to protect Australia’s agricultural industries and the natural environment by managing any disease or weed risks within an appropriately conservative quarantine framework, whilst still permitting import of benign and desirable plants.

In 1997 AQIS introduced a new system for screening new plant imports to reduce the levels of exotic weed pests entering and establishing in Australia, based on the principle of a permitted list of plants. This paper describes the operation and implementation of the process that AQIS adopted, and discusses the development of the policy underpinning the process.

INTRODUCTION

Effective plant quarantine is important for the protection of the biodiversity of the natural environment and Australia’s agricultural industries. Infestation of agricultural systems has the potential not only to incur costs in controlling pests and losses in production, but also to restrict access to export markets, if the pest has the potential to contaminate the marketable product.

Australia’s policy on the operation of plant quarantine has traditionally focused on preventing insect or disease entry with plant imports. The only exceptions were a small number of plants known to be major agricultural pests elsewhere and some environmental weeds, listed in Proclamations enacted under the Quarantine Act, 1908.

The introduction of the Hazard system in 1990 to identify potential weeds was recognition of the need for a more comprehensive screening of imports (Hazard, 1988). The Hazard system utilised 14 questions relating to a plant’s weed history and known weedy relatives, with a focus on weeds of agricultural systems. Although the Hazard system was an improvement on the system of ad hoc assessment, basing the assessment on known weediness was a major limitation of the system. Experience has shown that many plants that have become weeds in Australia have not been recorded as weeds overseas. Prickly pear (Opuntia spp.) and bitou bush (Chrysanthemoides monilifera ssp rotundata) are two well known examples of plants which are, at worst, minor pests overseas, but became serious weeds in Australia. As most recorded weeds are weeds of agricultural systems the Hazard system was also limited in its ability to identify environmental weeds.

Increasing recognition of the importance of environmental weeds, and Australia’s obligations under international treaties to use scientifically based risk assessment systems, led AQIS to participate in 1994 in a joint initiative led by the Australian Plant Industries Committee to examine screening protocols for plant introduction (Panetta et al, 1994). The resulting workshop “Screening plants for weediness” was the first step towards a new system.

DEVELOPING A NEW WEED RISK ASSESSMENT SYSTEM

The major considerations in the selection of the new system can be divided into three categories:

1. the policy of the incumbent government;
2. Australia’s domestic legislation relating to quarantine and the environment; and
3. Australia’s international obligations relating to trade and the environment.

1. Government policy and quarantine in the 1990’s

(a) The National Weeds Strategy In 1991 the Commonwealth, State and Territory ministers responsible for agriculture, forestry and the environment agreed in principle to develop a National Weeds Strategy (NWS). The NWS came into operation in 1997 when it was funded by the Natural Heritage Trust, a body estab-
lished by the federal government to distribute funds to projects directed at developing sustainable agriculture and protecting biodiversity.

The first goal of the NWS was the prevention of the development of new weed problems. The NWS provided funding to AQIS to implement a new screening process able to identify potential weeds of all ecosystems including agricultural, rangeland, bushland and aquatic systems, to be applied to all new plant imports (ARMCANZ, 1997). This funding was critical in both the development and implementation stages of the new WRA system.

(b) The Nairn Review A comprehensive review of Australian quarantine was undertaken in 1996, chaired by Professor Malcolm Nairn. The review produced a number of recommendations relating to the overall conduct of quarantine, including the need to:

1. engage industry, government and the general public in a partnership approach to quarantine;
2. take greater account of environmental considerations;
3. increase the quarantine resources devoted to plant issues;
4. recognise that quarantine is a continuum including pre-border, border and post-border activities; and to
5. conduct risk assessment in a way that allows industry and the general public to have their views considered, and that is transparent, scientifically based and allows for appeal on process (Nairn et al., 1996).

A report funded by the review found that the increasing rate of plant naturalisations, with over 290 plants naturalising in the past 25 years (Groves, 1997), was a major source of concern. Over 65% of these plants were deliberately introduced for horticultural purposes. The review supported the introduction of a system based on a model for determining weediness of new plant introductions developed by Pheloung (1995), which was based on risk analysis principles including the use of a permitted list as the basis for approvals.

The endorsement and funding for the implementation of many of the recommendations made by the review reflected a rise in the government’s perception of the importance of quarantine issues.

2. The legal basis of quarantine in Australia

(a) The Quarantine Act The Quarantine Act, 1908, defines quarantine as “measures for the inspection, exclusion, detention, observation, segregation, isolation, protection, treatment, sanitary regulation and disinfection of vessels, installations, persons, goods, things, animals, or plants, and having as their object the prevention of the introduction or spread of diseases or pests affecting human beings, animals, or plants.” The Act makes no distinction between diseases and pests of agriculture and those of the environment.

As mentioned previously, until recently all plants not expressly prohibited were permitted import as seed. Prohibited plants were listed in proclamations subordinate to the Quarantine Act, 1908. In 1998 a new proclamation under the Act introduced a permitted list for plant imports. All plants not on the permitted list are now prohibited. To import a species not on this list an import application must be completed, and the weed risk of the plant assessed using the WRA system and found to be manageable.

Decision making based on import risk analysis under the Quarantine Act 1908 must conform with international trade standards and the relevant provisions of domestic environmental legislation and related arrangements dealing with environmental impact assessment, protection of Endangered Species and protection of World Heritage areas and the National Estate.

(b) Environmental law and quarantine in Australia Prior to the passing of the Environment Protection Biodiversity Conservation Bill in June 1999, the Environment Protection (Impact of Proposals) Act 1974 (EP(IP) Act) was the environmental legislation most directly relevant to the operation of quarantine risk assessment processes, effectively encompassing the requirements of Australia’s other environmental legislation. The object of the EP(IP) Act was to ensure that matters affecting the environment to a significant extent were fully examined and taken into account in the making of decisions and recommendations by the Australian Government and its authorities. For the purposes of quarantine, if the Department of Environment and Heritage advised AQIS that its’ import risk assessment processes adequately covered environmental issues then there was no need to invoke the processes under the EP(IP) Act.

The Department of Environment and Heritage has endorsed the AQIS WRA process, allowing assessments to be made without invoking the EP(IP) processes.
Although the *Environment Protection Biodiversity Conservation Bill* will replace this Act, it is unlikely that the new legislation will affect the processes for the weed risk assessment of new plant imports outlined here.

3. International obligations and quarantine

(a) Trade agreements  Australia is a signatory to the International Plant Protection Convention (IPPC). This convention aims to prevent the transfer of organisms that will harm agricultural systems. The IPPC administers the International Standards for Phytosanitary Measures (ISPMs) which outline various plant quarantine methodologies developed by the contracting parties. Australia is also a signatory to the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS agreement).

The SPS agreement addresses measures to protect human, animal or plant life or health from risks arising from quarantine pests (WTO, 1994). The SPS agreement recognises the ISPMs set by the IPPC as the relevant international standards. SPS measures must be:

- applied only to the extent necessary to protect human, animal or plant life or health;
- based on scientific principles and not maintained without scientific evidence; and
- not applied in a manner which would constitute a disguised restriction on international trade.

In order to assist this task the IPPC has developed guidelines for risk analysis (FAO, 1995). These guidelines include a definition of a quarantine pest that must be used: ‘A pest of potential national economic importance to the area endangered thereby and not yet present there, or present but not yet widely distributed and being officially controlled’ (FAO, 1997).

(b) Environmental agreements  Australia ratified its membership of the Convention on Biodiversity in June 1993. The Convention on Biodiversity is a framework for global action to conserve and sustainably use biological diversity. Its requirements include measures for *in situ* conservation, which is the conservation of ecosystems, natural habitats and species in their natural surroundings, and involves control of alien species and genetically modified organisms (UNEP, 1992).

The guidelines for implementing the requirements of the Convention on Biodiversity are still being developed. However the environmental concerns specified in the Convention on Biodiversity were considered when selecting a WRA system, in order to minimize any conflict between the eventual guidelines and AQIS policy.

THE AQIS WRA SYSTEM

The AQIS WRA system is a three tiered system. The first tier determines whether a plant is already naturalised in Australia, and not officially controlled, or on a list of permitted plant imports. Plants that are not already present or permitted proceed to the second tier. The second tier is based on the Pheloung model (Pheloung, 1995; Walton *et al.*, 1998), and consists of a questionnaire which evaluates the weed risk of plants using 49 questions about the plants’ biology, climatic preferences, reproductive and dispersal methods, and known weed history. The questionnaire is designed to identify weeds of natural and agricultural systems. Depending on the score generated importation of the plant is permitted, rejected or prohibited pending ‘further evaluation’. Plants that require further evaluation proceed to the third tier of assessment.

The questionnaire was calibrated using 370 species already introduced to Australia. With this calibration the AQIS WRA accepted no serious weeds, only 16% of the minor weeds, and rejected 7% of the non-weeds. Twenty-nine percent of the species required further evaluation (Pheloung, 1996).

A process for assessing plants in the third tier is necessary because the international standards for quarantine risk assessment which AQIS follows are based on the principle of ‘manageable risk’. Risk analysis seeks to reduce the possibility of harmful organisms entering by identifying risks and determining how they can best be managed. The objective of third tier trials will be to quantify an otherwise unknown risk, and assess the effectiveness of potential management options.

An assessment process for the third tier is currently being developed. Plants enter the third tier because insufficient information exists in the literature, they cannot be assessed by the WRA questionnaire, or they are genetically modified organisms (GMOs) which are considered to have changes that will affect their weed potential. The process is being designed to integrate with other assessment procedures that GMOs must undergo before they are released, to avoid duplication of effort.

It is intended that the third tier process will allow for glasshouse trials to gather information not present in the literature. Field trials under strict quarantine may
also be permitted if the WRA questionnaire assessment is indeterminate, significant potential economic benefits may result from using the species, and an effective control measure has been demonstrated. Potential pasture species are likely to fall into the latter category because they are selected for characteristics such as drought tolerance and ability to grow in low nutrient soils. These characteristics are scored in the WRA questionnaire as contributing to the ability of a plant to become a weed problem. However, unless the plant is a known weed elsewhere, those characteristics would not necessarily be sufficient to consider the plant a significant weed risk in Australia.

The cost of the standard weed risk assessment (tier two) is being borne by the government, not the importer, as it is considered a component of the governments’ service obligation to the community. The costs for the third tier assessment of a species will, however, be borne by the importer.

CONCLUSION

In developing a new WRA system AQIS was required to balance conflicting needs. It was necessary to develop a transparent and scientifically valid system that would allow new (safe) imports, protect industry and the environment, be consistent with domestic regulations and meet Australia’s international obligations.

The system chosen continues to permit imports while utilizing a transparent and scientifically valid risk assessment process as required under the SPS agreement. Evaluation of the system showed that it should exclude all major weeds, whilst still permitting the majority of non-weedy plants, thus both permitting import and protecting industry and the environment.

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REFERENCES


