

Chapter 4

The proposed importation of pineapples from Malaysia

4.1 The terms of reference for this inquiry required the committee to examine the scientific basis on which the Import Risk Analysis (IRA) report for the importation of fresh, decrowned¹ pineapple was developed. The committee was also required to determine the adequacy of quarantine conditions and measures recommended by DA Biosecurity in relation to the importation of pineapple from Malaysia.

Australia's pineapple industry

4.2 The Australian pineapple industry is a relatively small but important agricultural industry. The following section provides a brief background on the Australian pineapple industry and provides context for the later discussion of the December 2012 *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr) fruit from Malaysia* (the pineapple IRA).²

4.3 The most suitable soils for pineapple production are non-compacted, well-aerated loams, sandy loams and clay loams, which have no heavy clay or rock within one metre of the surface. Good drainage is essential, particularly because poor drainage can lead to a weak root system and make plants more susceptible to root and heart rot diseases.

4.4 Temperature is the most important climatic factor affecting productivity. The optimum air temperature is 32° Celsius during the day and 20° Celsius at night. For every 1° above or below these temperatures, the optimum growth rates decrease by about 6 per cent. During periods of intense sunlight and high temperature (above approximately 35° Celsius) fruit also becomes susceptible to sunburn damage. A frost-free site is essential and for non-irrigated crops, rainfall should be well distributed throughout the year and in excess of 750 mm per annum.

4.5 Australian pineapples are grown year round – primarily in Queensland – with an average turn-around of 18 months from planting to crop harvest and 16 months from crop harvest to the ratoon crop³ harvest.

1 Decrowned pineapple fruit is fruit that has had both the crown and basal leaves removed.

2 The following background in relation to Australia's pineapple industry is based on information contained in Australian Pineapple Industry, Strategic Plan 2011–2016, p. 6, Queensland Government, Department of Agriculture, Fisheries and Forestry website www.daff.qld.gov.au/26_16329.htm, accessed 21 January 2013; Plant Health Australia, *National Pineapple Industry Biosecurity Plan*, Version 1, July 2008, pp 5–6; and Growcom, *Submission 5*, p. 4.

3 Ratoon cropping is growing a fresh crop from the stubbles or suckers of the plant crop without replanting. It is also referred to as stubble cropping, re-harvesting or second crop. Ratoon cropping is used extensively in sugarcane, banana and pineapple plantations.

4.6 In the 2009-10 season, the Australian pineapple processing sector produced 41 000 tonnes of fruit for canning and juicing, which was worth \$13.25 million. This sector of the industry, has however, been in decline over many years, due in part to competition from cheaper imported product.

4.7 In contrast, the fresh pineapple sector has expanded considerably over the last 12 years, due to both improved quality and the adoption of better fresh market fruit varieties. In the 2009-10 season, 43 720 tonnes of fresh pineapple was produced and sold on the domestic market. The gross value of Australian pineapples at the farm gate is currently estimated at \$79 million.

4.8 Production is predominantly concentrated in South East Queensland and key production districts include: North Queensland, Yeppoon and Cawarral, Bundaberg, Maryborough and Hervey Bay, Mary Valley and Nambour, Glasshouse Mountains and Beerwah, Wamuran and Elimbah. It is estimated that approximately 60 per cent of pineapples produced for the fresh fruit market and for processing are grown in the Cooloola-Sunshine Coast region.

4.9 More than 70 per cent of fresh pineapples are packed and marketed through four primary packhouses. Golden Circle, which was recently acquired by Heinz Australia, is the one primary pineapple processor. As noted above, however, the industry is becoming increasingly fresh-market based, due to new fresh-market varieties and competition from imported processed fruit.

4.10 The fresh fruit market is split between Smooth Cayenne, Queen (rough leaf) and new hybrid varieties. The hybrid varieties are noted for their higher sugar to acid ratios and greater consistency. Current hybrid varieties include 73-50, MD2 (73-114) which are marketed under various brand names, and Aus-Jubilee and Aus-Carnival.

4.11 The majority of Australian produced fresh and processed pineapples are consumed within Australia. Exports of fresh pineapples account for only 6 per cent of total production and only a small quantity of Australian processed pineapple is exported to retail markets in New Zealand. There is limited potential for expansion of export markets, primarily due to the competition of lower-cost production in Asian countries. There has, however, been some interest in reviving the New Zealand market, and the pest free status of Australian produce may play an important role in increasing Australia's market share.

4.12 There are limited fresh pineapple imports into Australia, but extensive processed imports. Countries currently able to import fresh pineapple include the Philippines, Sri Lanka, the Solomon Islands and Thailand.

Pests and diseases

4.13 The National Pineapple Industry Biosecurity Plan for the pineapple industry (the Pineapple Biosecurity Plan) was developed by Plant Health Australia (PHA) in collaboration with industry and government stakeholders. It was launched in July 2008. The Pineapple Biosecurity Plan argues that Australia's geographic isolation has resulted in the region being relatively free of many of the pests and diseases that have impacted overseas plant industries. The Pineapple Biosecurity Plan also notes that:

Freedom from these exotic pests is a real trade benefit for Australia in terms of securing market access domestically and internationally. Maintenance of our plant health status is vital for retaining trade opportunities, negotiating access to new overseas markets and ensuring the future profitability and sustainability of our plant industries.⁴

4.14 The development of each Biosecurity Plan commences with the production of Threat Summary Tables (TST). These tables identify all the potential exotic pest threats to an industry and with expert consultation, rank their potential threat based on entry, establishment, spread potential, consequences of establishment and eradication potential (where available). From this information, the high priority Emergency Plant Pests can be established (for which diagnostic protocols and contingency plans are created).⁵

4.15 The Pineapple Biosecurity Plan lists (in alphabetical order) the top-ranked pest threats to the Australian pineapple industry as:⁶

- **False codling moth; bollworm** – *Cryptophlebia leucotreta* or
- *Argyroploce leucotreta*; *Cryptophlebia roerigi*; *Thaumatotibia roerigii*; *Olethreutes leucotreta*;
- **Grey pineapple mealybug; annona mealybug** – *Dysmicoccus neobrevipes*;
- **Bacterial fruit collapse** – *Erwinia chrysanthemi* (distinct pathovar);
- **Fusariosis** – *Fusarium guttiforme*; and
- **Pineapple fruit borer** – *Strymon megarus* or *Thecia basilides*.

4.16 The pest threats on this 'Emergency plant pest priority list' are all exotic pests not currently found in Australia. Importantly, for this inquiry, the risks associated with Bacterial fruit collapse are rated as 'high' in relation to entry potential, establishment potential, spread potential, economic impact and risk (see Appendix 13 for further detail).

4.17 The Pineapple Biosecurity Plan stresses the importance of a consistent approach to threat identification and risk assessment, and argues that facilitating a more coordinated strategy will provide a stronger base for future risk management activities.⁷

4 Plant Health Australia Fact Sheet, *National Biosecurity Plan for the Pineapple Industry*, June 2008, p. 1.

5 Plant Health Australia Fact Sheet, *National Biosecurity Plan for the Pineapple Industry*, June 2008, p. 2.

6 Plant Health Australia, *National Pineapple Industry Biosecurity Plan*, Version 1, July 2008, Table 1, Emergency Plan Pest Priority List, p. 7.

7 Plant Health Australia, *National Pineapple Industry Biosecurity Plan*, Version 1, July 2008, p. 5.

4.18 As part of a coordinated approach, the Pineapple Biosecurity Plan defines 'Emergency plant pests' as those that meet one or more of the following criteria:

- (a) It is a known exotic plant pest, the economic consequences of an incident of which would be economically or otherwise harmful for Australia, and for which it is considered to be in the regional or national interest to be free of the plant pest.
- (b) It is a variant form of an established plant pest which can be distinguished by appropriate investigative and diagnostic methods, and which if established in Australia, would have a regional or national impact.
- (c) It is a serious plant pest of unknown or uncertain origin which may, on the evidence available at the time, be an entirely new plant pest, and which if established in Australia would have an adverse economic impact regionally and or nationally.
- (d) It is a plant pest of potential economic importance to the area endangered thereby and not yet present there or widely distributed and being officially controlled, but is occurring in such a fulminant outbreak form, that an emergency response is required to ensure that there is not either a large scale epidemic of regional or national significance or serious loss of market access.⁸

4.19 The Pineapple Biosecurity Plan also argues that the identification of high risk pests facilitates:

- a more pre-emptive approach to risk management;
- the implementation of effective grower and community awareness campaigns;
- targeted biosecurity and education and training programs for growers and diagnosticians; and
- the development of pest-specific incursion response plans.⁹
- Listed on PHA plant pest priority list

Committee comment

4.20 The committee notes that PHA's description of the impact of Emergency Plant Pests (EPPs) echoes the sentiments expressed by industry stakeholders over the years. PHA argues that EPPs:

...have the potential to deeply impact on the livelihoods of producers and others along the value chain, damage the economic health of industries and

8 Plant Health Australia, *National Pineapple Industry Biosecurity Plan*, Version 1, July 2008, p. 5.

9 Plant Health Australia, *National Pineapple Industry Biosecurity Plan*, Version 1, July 2008, p. 5.

regional economies, deplete amenity values and food security for the broader Australian community, and tarnish Australia's reputation as a producer of clean, quality product internationally.¹⁰

4.21 The committee also notes that PHA supports the adage that 'prevention is better than cure'¹¹ and agree with industry stakeholders who argue very strongly that preventing incursion is ultimately preferable to managing incursion:

When EPPs are detected early enough, eradication may be an option, but these are invariably expensive and technically challenging exercises with no guarantee of success.¹²

The import risk analysis for pineapples from Malaysia

4.22 The Department of Agriculture¹³ received a formal request for market access for fresh pineapple fruit to Australia (from the Malaysian Department of Agriculture) in May 2004. The Malaysian submission included information on the pests associated with pineapple crops in Malaysia and the standard commercial production practices for fresh pineapple fruit in Malaysia.

Timeline of events

4.23 Table 4.1 below provides a timeline of events in relation to the Malaysian pineapple IRA.¹⁴

Table 4.1—Timeline of Malaysian pineapple IRA

May 2004	DA Biosecurity ¹⁵ received a formal request from the Malaysian Department of Agriculture, seeking market access for fresh pineapple fruit to Australia.
September 2007	DA Biosecurity advised stakeholders that changes to the IRA process had been implemented when regulations made under the <i>Quarantine Act 1908</i> formally took effect. That advice also notified the transitional arrangements for DAFF Biosecurity's

10 Plant Health Australia, *Who is Plant Health Australia?* p. 2, accessed at www.phau.com.au/go/phau/our-company/documents, 5 March 2013.

11 Plant Health Australia, *Who is Plant Health Australia?* p. 2, accessed at www.phau.com.au/go/phau/our-company/documents, 5 March 2013.

12 Plant Health Australia, *Who is Plant Health Australia?* p. 2, accessed at www.phau.com.au/go/phau/our-company/documents, 5 March 2013.

13 Formerly known as the Department of Agriculture, Fisheries and Forestry (DAFF).

14 Unless otherwise indicated, the information provided in this table has been sourced from Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, June 2012.

15 DA Biosecurity was formerly known as Biosecurity Australia.

	import work program, including pineapples from Malaysia that would be conducted under the new regulated IRA process. ¹⁶
2009	A supplementary submission was provided by the Malaysian Department of Agriculture.
January 2010	The scope of the request from the Malaysian government was changed to consider fresh, decrowned pineapple fruit.
9 June 2010	DA Biosecurity formally announced the commencement of the IRA on pineapples from Malaysia and advised stakeholders that it would be progressed as a standard IRA, using the process described in the IRA Handbook.
July 2010	DA Biosecurity met with industry representatives to discuss development of the draft IRA report.
11 April 2011	DA Biosecurity provided a draft pest categorisation table for decrowned pineapple fruit from Malaysia to state and territory departments of primary industry/agriculture for their informal consideration of regional pests.
19 October 2011	DA Biosecurity released the draft IRA report for a 60 day stakeholder comment period.
25 November 2011	DA Biosecurity met with industry stakeholders.
Date unknown	Two submissions on the draft IRA report were received from the pineapple industry representative, Growcom and from the Queensland Department of Agriculture Fisheries and Forestry.
7 June 2012	DA Biosecurity notified stakeholders of the release of the Provisional final IRA for fresh pineapple fruit from Malaysia. Stakeholders were informed that the report had identified four species of mealybugs which required quarantine measures to manage risks to a very low level (in order to achieve Australia's ALOP). Stakeholders were also informed that appeals could be lodged (in writing) to the Import Risk Analysis Appeals Panel

16 Department of Agriculture, Fisheries and Forestry, Biosecurity Australia Advice 2010/18, *Commencement of an import risk analysis for fresh decrowned pineapple fruit from Malaysia*, 9 June 2010.

	(IRAAP) – within 30 days. The deadline for appeals was set as 7 July 2012. ¹⁷
13 July 2012	DA Biosecurity notified stakeholders that an IRAAP had been convened to consider an appeal submitted on the Provisional final IRA report for fresh decrowned pineapple fruit from Malaysia. The IRAAP Secretariat advised that one stakeholder had provided a submission during the appeal period and that IRAAP would consider the appeal and deliver a finding (or series of findings) in relation to the appeal by 21 August 2012. ¹⁸
14 December 2012	DA Biosecurity notified stakeholders that Australia's Director of Animal and Plant Quarantine had determined a policy for the importation of fresh decrowned pineapple from Malaysia, based on consideration of the IRA for fresh decrowned pineapple fruit from Malaysia. (In doing so, the Director provided guidance to the Department's permit issuing staff to take account of the measures set out in the final IRA report in considering applications for permits). ¹⁹

Scope of the IRA²⁰

4.24 The scope of the Malaysian pineapple IRA involved the consideration of:

...the quarantine risk that may be associated with the importation of commercially-produced fresh decrowned pineapple fruit *Ananas comosus* (L.) Merr. (decrowned pineapple fruit) free from trash from Malaysia, for human consumption in Australia.²¹

17 Department of Agriculture, Fisheries and Forestry, Biosecurity Advice 2012/13, *Provisional final import risk analysis report for the importation of fresh decrowned pineapple fruit from Malaysia*, 7 June 2012.

18 Department of Agriculture, Fisheries and Forestry, Biosecurity Australia Advice 2012/15, *Appeal on the provisional final import risk analysis for decrowned pineapple from Malaysia*, 13 July 2012.

19 Department of Agriculture, Fisheries and Forestry, Biosecurity Australia Advice 2012/27, *Final import risk analysis report for fresh decrowned pineapple fruit from Malaysia*, 14 December 2012.

20 The detail provided in this section is based on information contained in the Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012.

21 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 2.

4.25 In the IRA, decrowned pineapple fruit are defined as fruit with crown and basal leaves removed. The IRA assessed all commercially-produced pineapple fruit *Ananas comosus* (L.) Merr. varieties of Malaysia and the regions in which they are grown.²²

4.26 As noted above, Australia currently permits the importation of fresh pineapple fruit from the Philippines, Thailand, Sri Lanka and the Solomon Islands, subject to a range of phytosanitary measures, including decrowning.

4.27 The committee was told that Australian imports of pineapple from these countries have been very limited. It was noted, for example, that there had been a small number of pineapples imported from the Philippines in 2006. These importations had however proved commercially unsuccessful. The committee also received anecdotal evidence regarding a small amount of imported fruit which had, over recent years, been provided to the Western Australian market.²³

4.28 In conducting the IRA, DA Biosecurity indicated that it had considered all pests previously identified in the IRAs for the importation of fresh pineapple fruit from the Philippines, Thailand, Sri Lanka and the Solomon Islands and taken them into account in the current policy where relevant. It is noted that these IRAs recommended decrowning as a risk management measure to meet Australia's ALOP.²⁴

4.29 The Malaysian pineapple IRA also noted that standard hygiene and cleaning practices, the registration of export grade fresh pineapple fruit plantations and phytosanitary inspections further reduce the risk of weed species entering Australia on decrowned fresh pineapple fruit.²⁵

Results of the IRA

4.30 The *Final import risk analysis report for the importation of fresh decrowned pineapple* (*Ananas comosus* (L.) Merr.) *fruit from Malaysia* (the final IRA) identified four species of mealybugs as quarantine pests that require measures to manage risk to a very low level in order to achieve Australia's ALOP.²⁶

22 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple* (*Ananas comosus* (L.) Merr.) *fruit from Malaysia*, December 2012, p. 2.

23 Mr Les Williams, Pineapple Growers Advancement Group, *Committee Hansard*, 6 August 2012, p. 14.

24 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple* (*Ananas comosus* (L.) Merr.) *fruit from Malaysia*, December 2012, pp 2–3.

25 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple* (*Ananas comosus* (L.) Merr.) *fruit from Malaysia*, December 2012, p. 3.

26 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple* (*Ananas comosus* (L.) Merr.) *fruit from Malaysia*, December 2012, p. xi.

4.31 Regional differences were identified for one quarantine pest—a mealybug species—for Western Australia. DA Biosecurity indicated that the proposed quarantine measures would take account of these regional differences.²⁷

4.32 The final IRA report recommended a combination of risk management measures and operational systems aimed at reducing the risk associated with the importation of fresh decrowned pineapple fruit from Malaysia into Australia to achieve Australia's ALOP. These measures included:

- pre-shipment or on-arrival methyl bromide fumigation or an alternative post-harvest treatment as approved by DA Biosecurity for mealybugs, and;
- an operational system for the maintenance and verification of the phytosanitary states of pineapple fruit, including:
 - registration of export plantations;
 - registration of packing houses and auditing of procedures;
 - registration of fumigators/treatment facilities and auditing of procedures;
 - packing and labelling requirements;
 - specific conditions for storage and transport;
 - pre-export phytosanitary inspection and certification by the Malaysian Department of Agriculture; and
 - on-arrival phytosanitary inspection, remedial action when required, and clearance by DA Biosecurity.²⁸

Changes to final IRA

4.33 DA Biosecurity noted that following consideration of stakeholder comments (in relation to the draft IRA) and a subsequent review of the literature, a number of changes were made to the risk analysis. These amendments included:

- additional points have been included under 'probability of importation and distribution' in the risk assessment of bacterial fruit collapse and heart rot disease caused by *Erwinia chrysanthemi* (pineapple strain, *Dickeya* sp.), and minor changes to the rating for consequences (but not resulting in any change to the unrestricted risk estimate);
- identification of the armoured scale, *Unapsis citri*, as a pest of regional concern to South Australia;

27 Department of Agriculture, Fisheries and Forestry, Biosecurity Advice 2012/13, *Final import risk analysis report for the importation of fresh decrowned pineapple fruit from Malaysia*, p. 1.

28 Department of Agriculture, Fisheries and Forestry, Biosecurity Advice 2012/13, *Provisional final import risk analysis report for the importation of fresh decrowned pineapple fruit from Malaysia*, pp 1–2.

- a summary of major stakeholder issues and how they were considered; and
- minor corrections and rewording for consistency and clarity.²⁹

Issues raised by stakeholders

4.34 The committee received submissions from a number of individual growers, industry organisations and peak bodies which expressed a lack of confidence in the Malaysian pineapple IRA, and its recommendation that imports of fresh, decrowned pineapple should be allowed for all commercial production areas of Malaysia (subject to a range of quarantine conditions).

Erwinia chrysanthemi (pineapple strain, *Dickeya* sp.)³⁰

4.35 Stakeholders, including the Queensland government, raised serious concerns about DA's assessment of the risks posed to Australia's pineapple industry by the importation of pineapples from Malaysia. Specifically, the Queensland government and industry representatives argued that there was a lack of knowledge and a limited understanding of the science in relation to the pathogen *Erwinia chrysanthemi* recently renamed *Dickeya* sp. and referred to by DA Biosecurity as *Erwinia chrysanthemi* (pineapple strain *Dickeya* sp.).

Scientific background

4.36 The Malaysian pineapple IRA noted that in 1953, the bacterial species *Erwinia chrysanthemi* was first proposed for the agent causing blight in chrysanthemums. Similar bacteria were later isolated from soft rots and wilts of numerous diseased plant species. Following extensive biochemical studies, all isolates were gathered into the single species *Erwinia chrysanthemi* (syn. *Pectobacterium chrysanthemi*). Subsequently, the genus *Pectobacterium* was included within the genus *Erwinia* and in 1980, phyto bacteriologists divided *E. chrysanthemi* into six pathovars.³¹

4.37 The use of pathogenicity tests to define the affiliation of a strain to a given pathovar ultimately proved difficult to implement. Therefore, in the early 1980s it was proposed that the pineapple strain be known as *E. chrysanthemi* (pineapple strain).

29 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. xi.

30 Unless otherwise stated, the following section is based on information contained in Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 37. Throughout this report "*Dickeya* sp." is used as shorthand for the pathogen "*Erwinia chrysanthemi* (pineapple strain, *Dickeya* sp.)".

31 These pathovars were: pv. *chrysanthemi*, pv. *dianthicola*, pv. *differbachiae*, pv. *paradisiaca*, pv. *parthenii*, and pv. *zetae*.

4.38 In 2005, Samson *et al* proposed a new genus—*Dickeya*—to accommodate bacterial species previously assigned to *E. chrysanthemi* and *P. chrysanthemi* and proposed six species of *Dickeya*.

4.39 However, the study found that the status of pineapple infecting strains was unclear. A strain isolated from pineapples in Martinique (France) was placed under *Dickeya zaeae* and the strain isolated from pineapples in Malaysia was placed under *Dickeya* sp. without being able to allocate it into any of the other six *Dickeya* species.

4.40 In 2009, Parkinson *et al* attributed the Malaysian pineapple infecting strain to *D. zaeae*. However, this study used the gene sequence at one locus and in 2011, the limitations of this type of approach were highlighted.

4.41 In 2010, Peckham *et al* argued that until the pineapple strains are genetically characterised, the strains infecting pineapples should be referred to as unclassified *Dickeya* sp. Marrero *et al* argued (in 2009 and 2010) that the pathogen infecting pineapple warranted classification as a new species or subspecies of *D. zaeae*. Most recently (2011) Marrero and Alvarez used the name *E. chrysanthemi* (*Dickeya* sp.).

Defining the pest

4.42 The Malaysian pineapple IRA noted that 'even after several decades of work, the position of the Malaysian pineapple affecting strains has not been resolved satisfactorily'.³² However, it was also noted that international guidelines for Pest Risk Analysis require that the identity of pests be 'clearly defined to ensure that the assessment is being performed on a distinct organism and that the biological and other information used in the assessment is relevant to the organism in question'.³³ It was decided, therefore, that in order to avoid confusion, and for the purposes of the IRA, the pineapple affecting strain would be referred to as *Erwinia chrysanthemi* (*pineapple strain, Dickeya* sp.).

4.43 The Malaysian pineapple IRA notes that the strain of the bacterium *E. chrysanthemi* infecting pineapple in Malaysia is specific to pineapple and that recent molecular studies 'support that the Malaysian pineapple strain is distinct'.³⁴

Fruit collapse and bacterial heart rot

4.44 The strain of *Erwinia chrysanthemi* infecting pineapples in Malaysia causes two diseases—fruit disease called 'fruit collapse' and a leaf and stem disease called 'bacterial heart rot'. Both diseases have been known in the Malaysian pineapple

32 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 38.

33 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 38.

34 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 38.

industry from around 1937. It has been reported that both diseases are now present in Costa Rica, the Philippines and Brazil.

4.45 In 2003, *Dickeya* sp. was discovered in Hawaii and it has been suggested that the first appearance of the pathogen in Hawaii 'coincided with importation of planting material from Costa Rica, Honduras, and Philippines'.³⁵ Although strains of *E. chrysanthemi* infecting other hosts including corn, potato, banana and ginger are present in Australia, the specific strain infecting pineapple in Malaysia is considered absent.

Threat to Australian pineapple industry

4.46 Stakeholders pointed to the inclusion of the pathogen *Dickeya* sp. on the Pineapple Biosecurity Plan's 'Emergency plant pest priority list',³⁶ and noted that the Pineapple Biosecurity Plan lists the level of threat (in relation to this pathogen) as 'high' for entry potential, establishment potential, spread potential, economic impact and overall risk.³⁷ It was argued, therefore, that the estimation of risk from this pathogen in the Pineapple Biosecurity Plan is in stark contrast to the IRA prepared by DA Biosecurity.³⁸

4.47 It was argued that both fruit collapse and bacterial heart rot pose 'serious biosecurity threats to the Queensland pineapple industry',³⁹ particularly as both diseases are systemic (able to spread throughout the whole plant and the fruit) and the pathogen can remain latent in fruit—even after harvest.⁴⁰

4.48 The Queensland Department of Agriculture, Fisheries and Forestry (DAFF Queensland) submission stated that:

DAFF Queensland scientists are of the opinion that these two diseases would have a high risk of spreading to Australia in imported fruit, even under strict inspection procedures.

In Malaysia, both diseases are endemic, with field crop losses of up to 40% recorded. These diseases were detected in Hawaii in 2003, and have subsequently caused significant crop losses.

Australia has very similar climatic conditions and pineapple varieties to both Hawaii and Malaysia. Therefore the impact of this disease in Australia

35 Mr Glenn Taniguchi, *Submission 10*, Appendix 1, [p. 1].

36 See, for example, Mr Chris Fullerton, *Submission 3*, p. 1, Pinata Farms, *Submission 6*, p. 1, Growcom, *Submission 5*, p. 4 and Queensland Department of Agriculture, Fisheries and Forestry, *Submission 8*, p. 1.

37 Growcom, *Submission 5*, p. 4.

38 Growcom, *Submission 5*, p. 4 and Queensland Department of Agriculture, Fisheries and Forestry, *Submission 8*, p. 5.

39 Queensland Department of Agriculture, Fisheries and Forestry, *Submission 8*, p. 1.

40 Queensland Department of Agriculture, Fisheries and Forestry, *Submission 8*, p. 1.

could reasonably be expected to approximate the field losses (up to 40 percent) reported from Malaysia.⁴¹

4.49 The Malaysian pineapple IRA indicated that the prevalence of the pathogen causing fruit collapse in Malaysian pineapple production systems has, over the past 50 years, been reported at various levels—ranging from 0–40 per cent. The IRA also noted that while there were no specific figures available regarding the incidence of fruit collapse in the new 'Josapine' and 'N36' varieties, 'the incidence of heart rot has been demonstrated to cause losses as high as 64 per cent in the 'Josapine' variety'.⁴²

Undetected (latent) infections

4.50 The Malaysian pineapple IRA noted that 'while the greatest incidence of fruit collapse can be observed in the field and such fruit excluded from harvest',⁴³ there is also research which indicates that a small percentage (up to 2 per cent) of fruit 'can remain as undetected latent infections beyond the initial picking phase'.⁴⁴

4.51 Stakeholders raised concerns about the possible latency of infection in pineapple fruit. The IRA report indicated, for example, that in the case of fruit collapse, the pathogen 'enters the plant through the flower and remains latent in the developing fruit for over 2 months'.⁴⁵ Stakeholders argued that this is problematic, particularly as it means that up to 2 per cent of fruit with latent infections could go undetected at harvest.

4.52 The Malaysian pineapple IRA noted that the percentage of fruit collapse is highest 2–3 weeks before harvest. It was also noted that:

DAFF agrees, like any other biological process, latency break and symptom expression times are variable and as seen from Liam and Lowings (1979), up to about 2% of fruit may not have expressed symptoms at harvest and may still have latent infection.⁴⁶

41 Queensland Department of Agriculture, Fisheries and Forestry, *Submission 8*, p. 1.

42 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 39.

43 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 40.

44 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 40.

45 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 40.

46 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 41.

Uncertainty about latency

4.53 Stakeholders also challenged the credibility of the 2 per cent latency figure cited in the IRA. It was noted, for example, that although the IRA report referred to Lim (1986) and Lim and Lowings (1979) to support the 2 per cent figure, the reliability of this information was questionable, given that it relies on data originally published in 1937 (Thompson).⁴⁷

4.54 Officers from DA Biosecurity acknowledged that 'up to two per cent of a consignment [of pineapples] will have a latent infection'⁴⁸ and argued that the two per cent latency figure is based on scientific research conducted in Malaysia and published in scientific journals.⁴⁹ In addition, DA Biosecurity also told the committee that:

The disease usually expresses two to three weeks before harvest. You will see it on the pineapples in the field; it will be quite obvious and it might be explosive in some cases. Obviously they are not going to pick those pineapples that are rotting and not very good. These are commercial plantations sending to an export market. They are looking to send the best fruit they can. The latency does not always break two or three weeks before harvest but the majority of them well, so you will see those symptoms on the fruit. Those will be excluded. So it will be there some time before you take them off and put them through the processing plant for export. There will be up to two per cent – and we have used a very conservative figure. That does not mean to say that every pineapple plantation in Malaysia will have two per cent latency in their fruit, but we were looking on the conservative side that up to two per cent will – and in may be fewer than that.⁵⁰

4.55 The Malaysian pineapple IRA also indicated that the Malaysian Department of Agriculture had provided some preliminary unpublished results from a field and packing house survey conducted in April 2012. The survey was designed to evaluate current rates of infection of pineapple fruit with the fruit collapse bacterium *E. chrysanthemi* and latency in export production systems.⁵¹

47 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 40.

48 Dr Colin Grant, Department of Agriculture, Fisheries and Forestry, *Committee Hansard*, 6 August 2012, p. 34.

49 Ms Ann Gardner, Department of Agriculture, Fisheries and Forestry, *Committee Hansard*, 6 August 2012, p. 34.

50 Ms Ann Gardner, Department of Agriculture, Fisheries and Forestry, *Committee Hansard*, 6 August 2012, p. 34.

51 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 41.

4.56 The IRA noted that the results of the survey were based on pineapples sampled from several fields and packing houses during the export packing process, and generally supported the possibility of fruit carrying lower levels of latent infection at harvest than indicated in the Lim and Lowings papers in the 1970s. It was acknowledged, however that 'DAFF is unable to fully assess this survey and trial with the limited methodological details and data provided'.⁵²

4.57 The issue of latent infection rates and the audit process was raised with peak industry body Growcom at the committee's August hearing:

Senator BOSWELL: We are in Malaysia. Someone is going to bring in some pineapples... Do you know what would be required in the audit?

Dr Gambley: I do not believe that they can audit for latently infected fruit in Malaysia. They can audit for fruit that is obviously showing symptoms and discard that fruit, but you cannot audit for something that is not showing disease. It would be packed and sent without detection.

Senator BOSWELL: So there is no way of knowing that the particular fruit could be diseased and there is no way of auditing it through the packing house. All you can audit is something that has the symptoms of the disease?

Dr Gambley: That is correct.⁵³

4.58 Mr Alex Livingstone, Chief Executive Officer of Growcom, agreed that the disease, in its latent phase, is undetectable and therefore it is likely that diseased fruit will be picked and shipped without being detected. Mr Livingstone argued that, as a consequence:

When that fruit comes into Australia it would bring the disease in with it. A serious point of contention is whether or not the disease will spread from there. We contend that the imported fruit could find its way anywhere around the retail distribution chain. It could find its way into the processing chain. Nobody knows what happens to the waste product. If a consumer buys a pineapple that is imported and this disease starts to take hold, the fruit will look unappealing and they will just toss the whole thing in the bin. So where does that end up? We do not know.⁵⁴

4.59 It was argued that the latency of the pathogen is just one of a number of areas where scientific information is inadequate and inconclusive. It was further argued the

52 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 41.

53 Dr Cherie Gambley, Pineapple Industry Development Officer, Growcom, *Committee Hansard*, 6 August 2012, p. 4.

54 Mr Alex Livingstone, Growcom, *Committee Hansard*, 6 August 2012, p. 3.

lack of conclusive information about the latency of the pathogen is unsatisfactory it is an area that should be researched and tested properly.⁵⁵

Committee comment

4.60 It is clear to the committee that there is considerable uncertainty surrounding latent infection rates of *Dickeya* sp., particularly as DA Biosecurity's best estimate of up to 2 per cent post-harvest latency is based on a study from the 1970s, which itself is based on research from the 1930s. The committee notes that DA was unable to fully assess a 2012 survey conducted by the Malaysian Department of Agriculture due to the provision of limited methodological details and data. The committee strongly supports the collection of more robust data and further analysis of this critical issue, prior to the commencement of any imports of fresh pineapple from Malaysia.

Recommendation 9

4.61 The committee recommends that before commencing the importation of fresh pineapples from Malaysia, the Department of Agriculture should establish to a much greater degree of certainty the degree of post-harvest latency of pineapple fruit collapse and heart rot.

DA Biosecurity has underestimated the risk

4.62 Stakeholders also argued that DA Biosecurity has underestimated the risks associated with *Dickeya* sp. It was claimed that DA Biosecurity not only underestimated the risk of the pathogen's arrival in Australia, but also underestimated the pathogen's potential to be distributed within Australia, to become established, and to spread.

4.63 The IRA contains a detailed assessment of the various preconditions necessary for an incursion of the pineapple fruit collapse and heart rot pathogen *Dickeya* sp. to occur.

Importation risk: low

4.64 The IRA concludes that there is a low likelihood that *Dickeya* sp. will arrive in Australia as a result of the importation of decrowned pineapple fruit from Malaysia. It is argued that:

As the exported fruit will be without crowns and all basal leaves, the association of the pest with the pathway would be only as the fruit collapse disease and not as the heart rot disease.

Although the incidence of fruit collapse in Malaysian pineapple plantations can sometimes be as high as 40%, the biology of the disease is such that infected fruit can be easily detected before or at harvest and inclusion of infected fruit in exports will be reduced to a high degree. However, a small volume (estimated as up to 2%) of export fruit may contain latent or visibly

55 Mr Alex Livingstone, Growcom, *Committee Hansard*, 6 August 2012, p. 2-3 and Mr Les Williams, Pineapple Growers Advancement Group, *Committee Hansard*, 6 August 2012, p. 13.

undetectable infection. Therefore the likelihood estimate for importation is 'low'.⁵⁶

4.65 Mr Glenn Taniguchi, Entomologist and Plant Pathologist from the University of Hawaii provided his views on evidence provided by DA Biosecurity and raised questions about how the figure of two per cent was arrived at:

Throughout this testimony the figure of 2% risk of importing infected fruits into Australia is mentioned. The question of how this figure was derived has not been answered. Is this an arbitrary number to coincide with "low risk"? A 2% risk cannot be a fixed figure when dealing with infections with *Dickeya* sp. because field infections fluctuate with weather conditions. Normal field infection ranges between 5% and 40%. Thus your risk goes up when field infection is higher.⁵⁷

4.66 Tropical Pines noted the concerns raised about *Dickeya* species (and the dangers of importing pineapples from Malaysia) by scientists in both Hawaii and Malaysia. Tropical Pines suggested that these concerns 'may have been ignored because their concerns have not been published as peer reviewed scientific papers'.⁵⁸

4.67 Tropical Pines also argued that the Department of Agriculture's own estimate is that infected pineapples will be imported into Australia at a rate of 2 per cent, and that the 'infection will be in a latent form and completely undetectable'. Tropical Pines therefore asked the question:

If, as DAFF biosecurity says, the disease would be very difficult to eradicate, why take any form of risk to allow the entry of a potentially damaging pathogen? While 2% may seem a low incidence, in real terms it amounts to 2 cases in every 100 cases of fruit. i.e. 14 fruit per pallet.⁵⁹

4.68 In its supplementary submission to the inquiry, Tropical Pines told the committee that by working through the IRA, they had 'reached very different conclusions about the overall risk of this bacterium'.⁶⁰ It was argued that:

The probability of importation has been assessed by DAFF Biosecurity to be low. Our view is that the risk of importation is certain or high as it has been acknowledged that the bacterium will enter Australia in 2% of the fruit that is imported.⁶¹

4.69 Growcom's submission expressed a similar view to that of Tropical Pines in relation to the risk of importing the pathogen, and noted that:

56 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 43.

57 Mr Glenn Taniguchi, *Submission 10*, p. 1.

58 Tropical Pines Pty Ltd, *Submission 4*, p. 1

59 Tropical Pines Pty Ltd, *Submission 4*, p. 1

60 Tropical Pines Pty Ltd, *Submission 4*, Supplementary Submission, [p. 2].

61 Tropical Pines Pty Ltd, *Submission 4*, Supplementary Submission, [p. 2].

It is the industry's position that DAFF Biosecurity has significantly underestimated the risk posed by the potential introduction of a bacterial pathogen that causes serious fruit disorders and crop failure.⁶²

Distribution risk: low

4.70 The IRA concludes that there is a low likelihood that the pineapple heart rot and fruit collapse pathogen *Dickeya* sp. 'will be distributed within Australia in a viable state as a result of the processing, sale or disposal of decrowned pineapple fruit from Malaysia and subsequently transfer to a susceptible part of a host.'⁶³

4.71 The IRA also states that the waste from any fruit carrying the latent infection would be 'discarded mostly into municipal waste by retailers, consumers, or processing plants.'⁶⁴ It goes on to describe the possible transfer mechanisms of the pathogen from infected fruit in waste to a susceptible host plant as a 'complex variable' which is dependent on a number of critical factors including:

...the location of the bacteria; survival in waste and viability; survival in water; survival in soil; transfer mechanisms; availability of hosts; host susceptibility and entry points; and inoculum source, dose and host proximity.⁶⁵

4.72 In summary the IRA concludes that:

...with a host range limited to pineapple, a number of factors would need to align in order to facilitate a successful transfer of this pathogen to a susceptible host. A freshly discarded infected fruit or infected waste would need to be in close proximity to a susceptible pineapple plant, with suitable vectors in the direct vicinity.

...

Potential vectors and agents of transfer are available; however, the transfer opportunity for ants and beetles and the viability of the bacterium in soil and water is short. Considering the low volume of fruit expected to be imported into Australia and distributed to and potentially disposed of in areas near pineapple production, the number of infected fruit that are likely to come in close proximity to susceptible pineapple plants would be limited. This will minimise the likelihood of achieving all the necessary factors for a

62 Growcom, *Submission 5*, p. 3.

63 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 43.

64 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 43.

65 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 44.

successful transfer. Therefore the likelihood estimate for distribution is 'low'.⁶⁶

4.73 However, this is not the conclusion of other stakeholders. At the Brisbane hearing, Mr Alex Livingstone, CEO, Growcom, noted that, according to the pineapple industry's national biosecurity plan, the *Dickeya* sp. pathogen is one of the pineapple industry's greatest biosecurity threats. Mr Livingstone also noted that in the Pineapple Biosecurity Plan the 'level of threat was estimated to be high for entry potential, establishment potential, spread potential, economic impact and overall risk'.⁶⁷

4.74 Mr Livingstone argued that the disease's spread potential is a serious point of contention. He told the committee that it was Growcom's position that:

...the imported fruit could find its way anywhere around the retail distribution chain. It could also find its way into the processing chain. Nobody knows what happens to the waste product. If a consumer buys a pineapple that is imported and this disease starts to take hold, the fruit will look unappealing and they will just toss the whole thing in the bin. So where does that end up? We do not know.

There has been no work done on what are called vectors or methods of transmission of the disease around Australia. That work cannot be done, because the disease is not here and some of the proposed vectors are native Australia. Therefore, you cannot do the research without matching those two up. We do not know how much transmission would happen through native Australian species.⁶⁸

4.75 NQ Paradise Pines raised similar concerns regarding the disposal of waste:

The possibility of infected fruit from Malaysia being purchased for example by a processor, who would be after a quantity of cheaper fruit, opens the door for the potential waste of cores and peel being dumped in a pineapple growing area with a very high chance of disease spreading to growing plants.⁶⁹

4.76 It is worth noting that Department of Agriculture officials acknowledged at the hearings that once fresh pineapples from Malaysia passed Australia's border controls, there would be no restriction on where they can be distributed:

If they have cleared the border, and we are satisfied that they have met our conditions, they can go wherever.⁷⁰

66 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 51.

67 Mr Alex Livingstone, Growcom, *Committee Hansard*, 6 August 2012, p. 2.

68 Mr Alex Livingstone, Growcom, *Committee Hansard*, 6 August 2012, p. 3.

69 NQ Paradise Pines, *Submission 2*, [p. 2].

70 Dr Vanessa Findlay, Department of Agriculture, Fisheries and Forestry, *Committee Hansard*, 12 March 2103, p. 19.

4.77 Furthermore, departmental officials explained that the shelf life of pineapples, and their rate of deterioration once they have cleared the border, 'is not relevant from the biosecurity perspective.'⁷¹

Establishment and spread risk: high

4.78 The IRA concludes that if *Dickeya* sp. were to achieve entry into Australia, the probability of establishment would be high:

The presence of the vectors of the disease and suitable environmental conditions in Australia, the strong reproductive and survival characteristics of the pest within pineapple plants, and a lack of fully effective cultural practices and control measures, all support a likelihood estimate for establishment of 'high'.⁷²

4.79 The IRA further concludes that once established, the likelihood of *Dickeya* sp. spreading within Australia is high:

Suitable environmental conditions and the presence of vectors in Australia, the intended use of the commodity, short distance movement with fruit and long distance movement with infected planting material, all support a likelihood estimate for spread of 'high'.⁷³

4.80 DA Biosecurity's assessment of the risk of the pathogen's spread as high, was one conclusion stakeholders were able to agree on.⁷⁴

Committee comment

4.81 The committee notes DA Biosecurity's assessment in relation to the probability of entry, establishment and spread of *Dickeya* sp. – the pathogen responsible for pineapple fruit collapse and heart rot.

4.82 It is clear to the committee that DA Biosecurity has undertaken an extensive assessment, but harbours concerns about the assessment in two important areas.

4.83 First, DA Biosecurity has assessed the probability of importation as 'low'. In the committee's view this appears to defy common sense. Although there is some uncertainty surrounding the precise figure, the Pineapple IRA has estimated that there is a two per cent latency rate post-harvest. The committee understands this to mean that for every 100 pineapples imported from Malaysia, up to two would be infected

71 Ms Rona Mellor, Department of Agriculture, Fisheries and Forestry, *Committee Hansard*, 13 March 2103, p. 20.

72 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 53.

73 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, p. 53.

74 See, for example, Tropical Pines Pty Ltd, *Submission 4*, Supplementary Submission, [p. 2] and Growcom, *Submission 5*, p. 5.

with *Dickeya* sp. but show no visible signs of fruit collapse and heart rot at the time of quarantine inspection.

4.84 The committee notes that, based on 2009-10 data, were Malaysian pineapples were to capture just one per cent of the domestic fresh pineapple market, up to approximately 8.5 tonnes of imported fresh pineapple would contain the undetected *Dickeya* sp. pathogen, and would be free to enter the Australian domestic fresh pineapple market.

4.85 Based on the above scenario, it is the committee's view that, should the proposal to import proceed, it is almost certain that pineapples infected with the *Dickeya* sp. pathogen will be imported into Australia. The committee therefore does not support the IRA's conclusion that the risk of importation of the *Dickeya* sp. pathogen is low and would expect a significantly higher probability to be assigned.

4.86 Second, as noted earlier, DA has no role in the process of post-quarantine control. Departmental officials told the committee that once cleared at the border 'they can go wherever'.⁷⁵ The committee acknowledges the complex path that would be required to distribute the *Dickeya* sp. pathogen from a retail outlet to pineapple growing areas. However, the committee has, over the years, observed many examples of flagrant biosecurity risks which were entirely unpredicted and unanticipated.⁷⁶

4.87 The committee is well aware that humans do not always act in entirely rational and predictable ways. It is for this reason that the committee does not support the IRA's conclusion that the risk of distribution of the *Dickeya* sp. pathogen is 'low' and would expect a moderately higher probability to be assigned.

4.88 The committee concludes, therefore, that DA Biosecurity should review its assessment of the probability of importation and the probability of distribution. If a risk above Australia's ALOP were to emerge, then the committee expects stronger mitigation measures would be required.

Recommendation 10

4.89 The committee recommends that the Department of Agriculture review its assessment of the probability of importation and the probability of distribution of the *Dickeya* sp. pathogen. If a risk above Australia's ALOP were to emerge from the review, then the committee expects stronger risk management measures would be required. If such risk management measures were not sufficient to reduce the risk to Australia's ALOP, then imports of Malaysian pineapples to Australia should not be permitted.

75 Dr Vanessa Findlay, Department of Agriculture, Fisheries and Forestry, *Committee Hansard*, 12 March 2103, p. 19.

76 The committee has over the years questioned the circumstances surrounding several biosecurity incidents. These incidents include the 2005 shipment of Brazilian beef (some of which was found dumped at the Wagga Wagga tip); a 2011 incident involving a group of Condobolin farmers who ordered fertiliser on the internet and were delivered 600 tonnes of Chinese soil; and a shipment of Malaysian raw peeled prawns (which tested positive for white spot syndrome virus) which was released into Australia in September 2010.

Assessment of consequences⁷⁷

4.90 DA Biosecurity noted that, in terms of the IRA process, the objective of the consequence assessment is to provide a structured and transparent analysis of the 'likely consequences if the pests or disease agents were to enter, establish and spread in Australia'.⁷⁸ It is also stated that the assessment considers 'direct and indirect pest effects and their economic and environmental consequences'.⁷⁹

4.91 According to DA Biosecurity, the IRA considered the direct pest effects in the context of the effects on plant life or health and other aspects of the environment. However, indirect pest effects are considered in the context of the effects on:

- eradication, control etc;
- domestic trade;
- international trade; and
- environment.

4.92 As previously indicated in Chapter 3, for each of the criteria listed above, the consequences were estimated over four geographic levels, defined as:

- **Local:** an aggregate of households or enterprises (a rural community, a town or a local government area).
- **District:** a geographically or geopolitically associated collection of aggregates (generally a recognised section of a state or territory, such as 'Far North Queensland').
- **Regional:** a geographically or geopolitically associated collection of districts in a geographic area (generally a state or territory, although there may be exceptions with larger states such as Western Australia).
- **National:** Australia wide (Australian mainland states and territories and Tasmania).

4.93 The magnitude of the potential consequences at each of these levels is then described, using the categories of indiscernible, minor significance, significant and major significance.

4.94 Estimates of the magnitude of the potential consequences over the four geographic levels were translated into a qualitative impact score from A to G using the

77 The following section is based on information contained in Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple (Ananas comosus (L.) Merr.) fruit from Malaysia*, December 2012, pp 10-12.

78 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple fruit from Malaysia*, p. 10.

79 Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple fruit from Malaysia*, p. 10.

Pineapple IRA's Table 2.3.⁸⁰ For example, a consequence with a magnitude of 'significant' at the 'district' level will have a consequence impact score of 'D'.

Table 2.3 Decision rules for determining the consequence impact score based on the magnitude of consequences at four geographic scales

		Geographic scale			
		Local	District	Region	Nation
Magnitude	Indiscernible	A	A	A	A
	Minor significance	B	C	D	E
	Significant	C	D	E	F
	Major significance	D	E	F	G

4.95 The overall consequence for each pest is achieved by combining the qualitative impact scores (A–G) for each direct and indirect consequence using a series of decision rules.⁸¹ These rules are mutually exclusive, and are assessed in numerical order until one applies.

Committee comment

4.96 Any 'consequence assessment' in relation to a crop such as pineapple must take into consideration its growing conditions. As indicated earlier in this chapter, to ensure optimum growth rates, pineapple is a crop that requires temperatures between 32° Celsius during the day and 20° Celsius at night, well-drained soil and rainfall in excess of 750 mm, evenly distributed throughout the year.

4.97 These specific growing conditions mean that pineapple is not a crop that will ever be grown in Australia's arid centre or its more temperate climates. This, therefore, excludes vast areas of Australia. Even on a regional scale, pineapples will never be suitable to be grown across all parts of Queensland – some parts of the state will be too hot and others too cold or too dry.

4.98 The committee is concerned, therefore, that because the growing conditions for pineapples are limited to a relatively small geographic area, the DA Biosecurity rules applied in tables 2.3 and 2.4 of the Pineapple IRA mean that regardless of how serious the impact of a pest may be on the pineapple industry, the consequence could never be rated above 'moderate'.

4.99 The committee also notes that DA Biosecurity also rated the consequence to 'plant life and health' as 'significant at a regional level'. 'Significant' is said to be related to a moderate increase in mortality/morbidity, or a moderate decrease in production. The committee is of the view that losses of 40 per cent and up to 64 per cent would better be described as a 'large decrease in production' which equates to a 'major consequence' rating. The committee notes that a 'major consequence' rating

80 Table 2.3 reproduced from Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple fruit from Malaysia*, p. 11.

81 These are contained in Table 2.4: Decision rules for determining the overall consequence rating for each pest, Department of Agriculture, Fisheries and Forestry, *Final import risk analysis report for the importation of fresh decrowned pineapple fruit from Malaysia*, p. 12.

would then shift the overall consequence to 'high' rather than 'moderate'. Based on this scenario, the overall rating would be increased to 'low' which is above Australia's ALOP.

Recommendation 11

4.100 The committee recommends that the Department of Agriculture review its assessment of the consequences of the establishment of the pineapple heart rot and fruit collapse pathogen *Erwinia chrysanthemi* (pineapple strain, *Dickeya* sp.) in Australia. If a risk above Australia's ALOP were to emerge from the review, then the committee expects stronger risk management measures would be required. If such risk management measures were not sufficient to reduce the risk to Australia's ALOP then imports of Malaysian pineapples to Australia should not be permitted.